

JOURNAL

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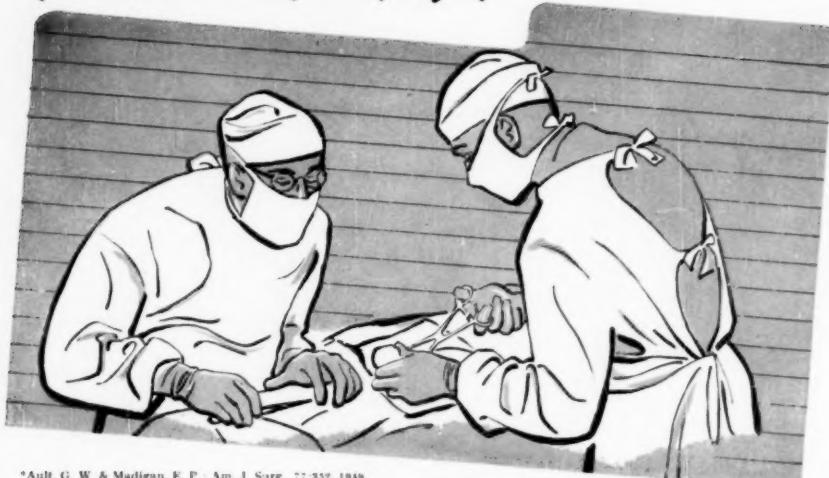
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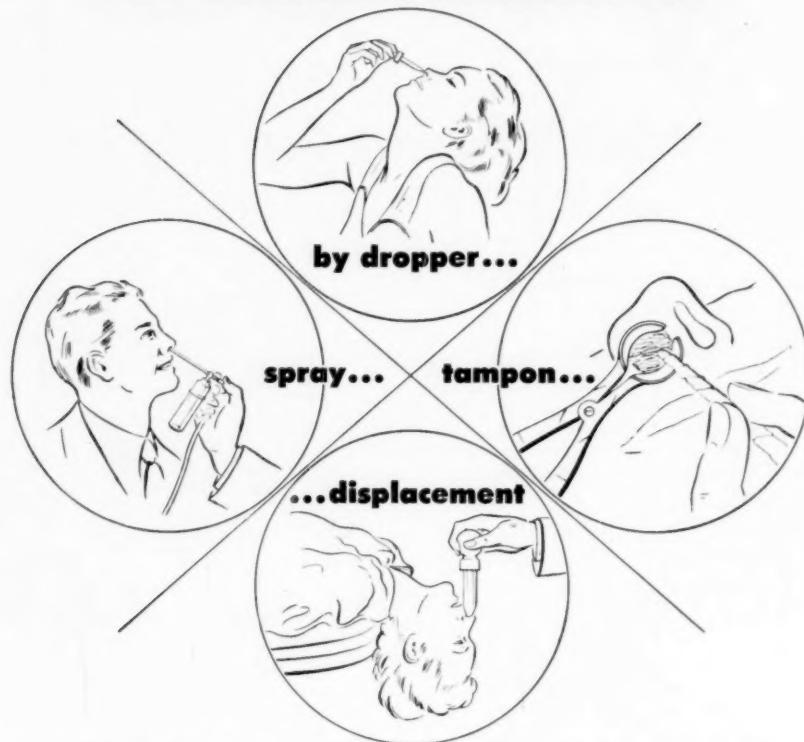
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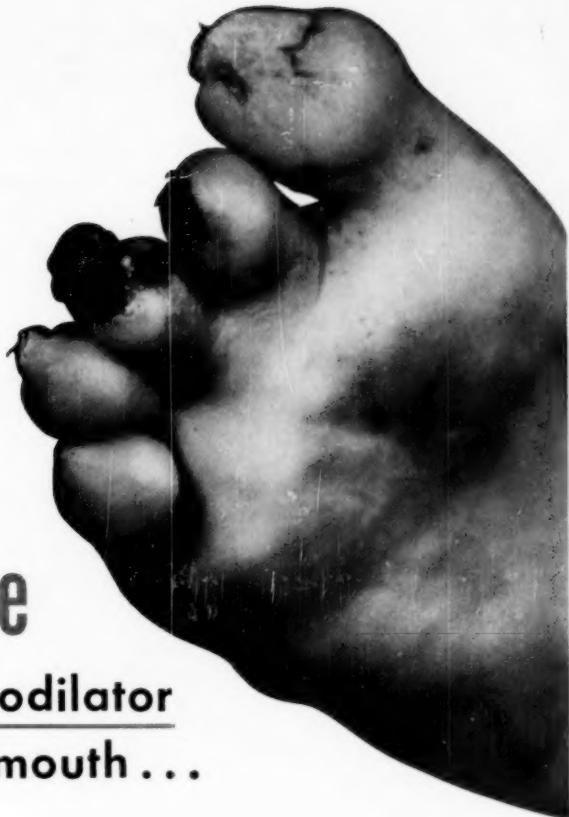
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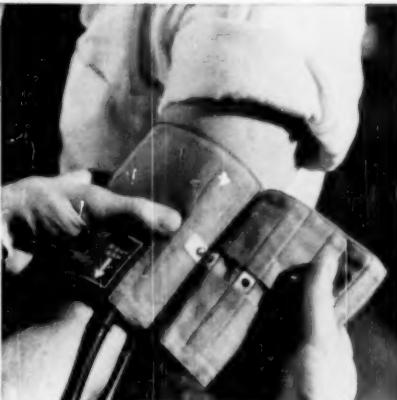
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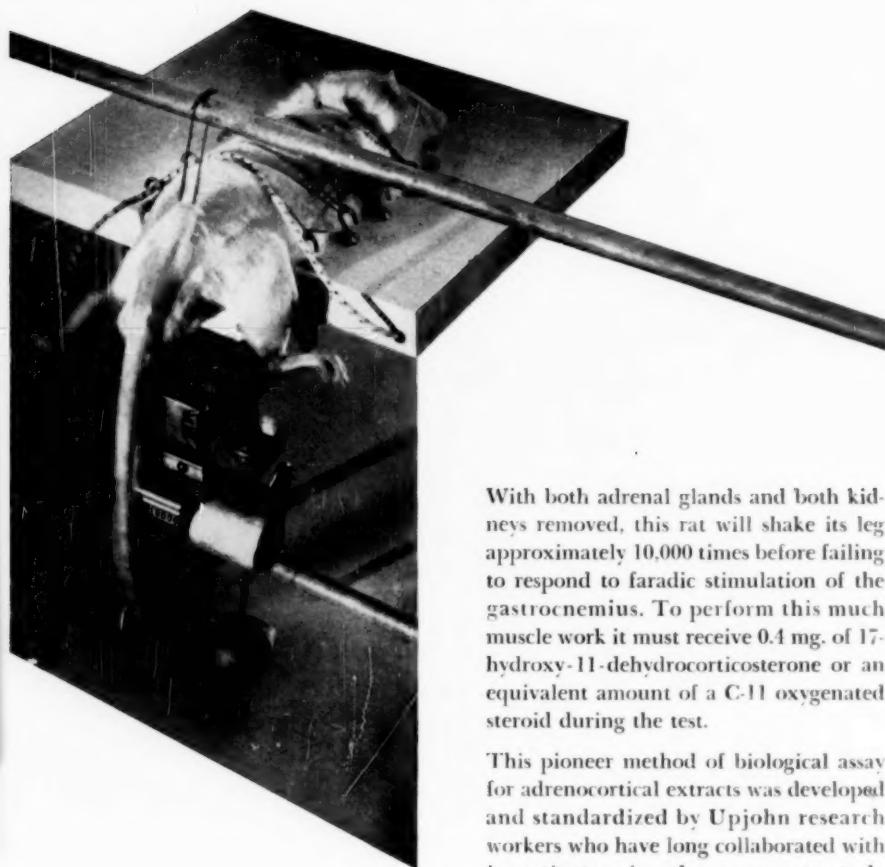


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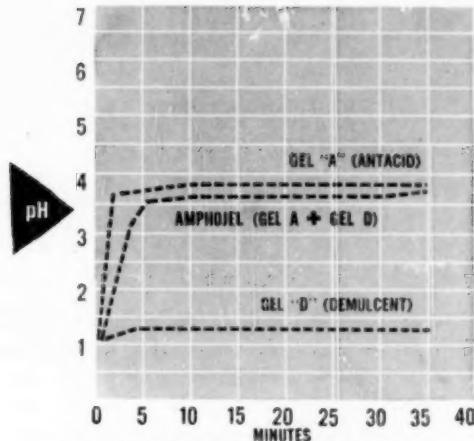
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FRED C. ZAPFFE, Editor

January, 1950

Address of President*

J. ROSCOE MILLER
President, Northwestern University
Evanston, Illinois

Since its establishment, this Association has concerned itself with problems of medical education and their possible solution. The custom of having the President make an address each year has given many of us an opportunity to present our views on these problems and make some suggestions—seldom heeded. These presidential speeches through the years, likewise, reflect the thinking on specific problems at any given period, and focus on the perplexities that plague administrators.

In reviewing the history of the Association, I was impressed with three points. In the first place, I was struck with the fact that basically, we are today dealing with the same problems with which we have always dealt. In the second place, I was left with some doubts as to whether, with all of our so-called advances, we are meeting these problems as successfully as our predecessors did. And thirdly, I have been impressed by our preoccupation with minutiae while matters of large scope and implication have been left for others to decide and develop.

The Association of American Medical Colleges was a natural outgrowth of changes in medical education which marked the latter years of the 19th century. About that time the preceptor system of instruction was beginning to be replaced by formal teaching in medical schools. As the schools began to assume the full responsibility for professional instruction, instead of merely supplementing the preceptor's teaching (as had usually been the case), weaknesses became more apparent and the need for reform more urgent. There was little uniformity in requirements and curriculum, each school setting its own. Since the salaries of the faculty and the very existence of the schools depended on the fees paid by the students, there was not much incentive to raise standards and run the risk of losing students to a competing institution. Preliminary requirements were so inadequate that many entered medical school without completing four years of high school. The graded curriculum was a new venture, not generally accepted, and clinical and laboratory instruction were inadequate or non-existent.

*Read at the Sixtieth Annual Meeting of the Association of American Medical Colleges, held in Colorado Springs, Colorado, November 7-9, 1949.

This unsatisfactory situation led to the formation of organizations which did much to improve medical education. The American Medical Association was organized largely to raise educational standards, was actively concerned with these problems, and made important contributions. The American Medical College Association, often spoken of as a forerunner of our present organization, was formed in 1876, but only lasted a few years through lack of support. One of the major causes of dissension in this group was the attempt of some members to extend the medical course to three years.

I would call your attention to the fact that it was not the medical schools that initiated reforms and elevation of standards, but rather an independent body of the profession possessed of energy, foresight and a zeal for the public good. Despite the antiquity of schools of medicine in the educational pattern, universities showed little interest or initiative in leading the way in this purely educational matter, although a number of the then existent medical colleges were departments of a university. It may well be that presidents of that era should be given some credit for wanting to evade the issue of medical education. It could be that their clairvoyance foresaw the harrowing lot which would befall their successors who had to grapple with the rising costs of their medical schools, the encroachment of government on the educational structure, and the plague of licensing and accrediting bodies, real and pseudo, which flourish in the garden of medicine and its kindred disciplines today.

In March, 1890, Drs. Cordell and Friedenwald of Baltimore, sent a circular to the various medical schools, urging that representatives convene at the next meeting of the American Medical Association, to be held in Nashville the following May, and be prepared to consider certain problems of medical education, specifically, (1) a three year course of six months sessions; (2) graded curriculum; (3) written and oral examinations; (4) a preliminary examination in English; and (5) laboratory instruction in chemistry, histology and pathology. The proposed meeting was well attended and it was unanimously agreed to form an organization to be known as the Association of American Medical Colleges. Our present Association thus came into existence.

We then settled down to a long series of meetings given over to profound discussions on the place of anatomy in the medical curriculum, and the urgent need for more correlation, with occasional forceful, oft-times brilliant dissertations by farsighted members, calling attention to certain trends and asking cooperation in planning for the future.

Our tranquility was rudely shattered by world war II. The character of our discussions changed abruptly. Like the football team which has avoided scrimmage, we did not know what to do with the ball when we had it. Our fumbles are a matter of record. War results in few things that can be considered worthwhile. Offhand, I would say that two of the apparent benefits derived from the last conflict are the return to religion evidenced in our undergraduate students, and the alteration in the subjects of discussion by this Association.

The problems considered by the Association have fallen, in general, into

three main groups: (1) preliminary or premedical education; (2) questions relating to instruction—courses, methods, examinations, clinical vs. preclinical subjects, laboratory work, objectives, etc.; and (3) finances.

As might be expected, teaching problems have always held an important place. However, there has been some shift in the emphasis on the other issues. The question of preliminary or premedical education, although still much talked about, no longer dominates the scene as it once did, whereas finances seem to be the concern that now outweighs all others.

Preliminary education receives less attention for the obvious reason that many of the objectives have been attained. We have made real progress here; for in 1890 there were no uniform preliminary requirements and it was necessary to fight for years in order to have a four year high school course a prerequisite to medical school admission. We spend considerable time today talking about what undergraduate courses to require, and probably never will settle this issue to everyone's satisfaction; but we now have students who are, theoretically at any rate, well prepared and this question is by no means as serious as many of the others with which we are faced. I consider this the outstanding accomplishment of this organization.

As regards teaching problems, there has been no great change either in the issues or in what has been said about them. At almost every meeting there has been discussion on the curriculum, of the correlation between clinical and preclinical subjects, and of full time versus part time clinical teachers. At a slightly later date we began to worry about training for specialties and whether the science of medicine was being emphasized to the neglect of the art. There is no time here to review the discussions of these and other problems in any detail, but I should like to cite a few illustrations to show something of the vision which characterized our predecessors. In 1892, when even a three years' course was the cause of much dispute, Dr. N. S. Davis offered a program that in general outline would not require great modification today. He insisted on a four year course with provision for laboratory, clinical and didactic work. He recommended that clinical instruction begin in the second year with instruction in physical and laboratory diagnosis and a study of "pathologic changes." By the third year he proposed that attention be directed to a study of the "methods and means of treatment, both medical and surgical."

We do a good deal of arguing today about the value of having full time clinical teachers and many of the proponents of this arrangement like to feel they are exceedingly progressive and are supporting a revolutionary trend in medical education. The temptation is strong to call attention to the fact that Ingals touched on this question in 1895, in the first presidential address before this Association; in 1910, Hoxie advocated that the clinical departments be staffed with salaried men who devote most of their time to teaching.

Training for the specialties is a problem which began to receive serious attention about the time of the first world war. Serious attention, that is, from everyone but us. Now we are confronted with a situation where an

essential section of medical education is controlled by those outside the educational structure.

John M. Russell, speaking to us a short time ago on a number of our problems, advised the deans to assume leadership in medical education and warned, "If you don't assume control of medical education, others will. . . ." Even as he spoke, his warning had already been fulfilled as regards specialty training. Training in a recognized specialty is as much an educational experience as undergraduate instruction, and should be handled in a like manner.

We now witness the incongruous situation of a dean writing to the secretary of a non-licensing, non-educational organization to ascertain whether training given by his faculty in his school or hospital is adequate to be recognized for the training of a specialist.

I am not unmindful that the criticism I level at medical educators is equally applicable to other branches of the university. We have allowed education in almost every phase to be dictated by self-appointed, self-styled arbitrators—what should be taught, how much, and by whom—until the administration of the so-called institutions of higher learning has become an uninterrupted compilation of data to complete questionnaires—and we have no one to blame but ourselves. We have sold ourselves a long way down the river. It is to be hoped that we have the courage and conviction to return the direction of education where it rightly belongs—to the university. My thinking on this point is, of course, not new. In 1912, Harlow, speaking before this body, suggested granting an advanced degree for specialty training, and Alan Chesney pointed out that specialty boards are setting arbitrary standards which are not always the ones we ourselves would make. They are doing it largely because we failed to take the initiative; and I foresee that this outside control is going to become less and less to our liking.

Of all the problems with which we deal at this time, I imagine most of this group would say financial support is the greatest. This, too, is an old problem. Ingals (1895) had a good deal to say about the need for liberal endowments and talked in some detail about the cost of establishing and operating a "thoroughly equipped medical college." He also touched on the expenses of teaching hospitals and clinics, and expressed the conviction that their costs should not be included in the educational expenses and should be financed by separate charitable contributions. But we paid little heed. In 1908, the President of this Association stated that "the greatest single difficulty in the way of progress in medical education is undoubtedly poverty."

Although, since that time, the schools have received substantial endowments and the budgets of tax supported institutions have grown enormously, the problem of financial shortages has become worse. As we know, in 1947, a group of nineteen university presidents signed a statement that medical education and research were being seriously imperiled by lack of funds and that without "prompt and generous aid our medical schools, through their graduates, cannot be expected to safeguard the future of the American citizens and their children." And Dr. Alan Valentine, president of the Univer-

sity of Rochester, recently described the financial plight of medical schools as "desperate."

The following is a quotation from a paper delivered before the American Medical Association: "As a consequence of the broadening and lengthening of the medical course of study, the cost of medical education has enormously increased. . . . The number of laboratories required in the present day in a fully equipped medical school is astonishing . . . " ". . . the difference between the education given twenty-five years ago . . . and the modern methods of education in the laboratory and the hospital, as well as the lecture room, which require enormous expenses, is an ample reason for large endowments. . . ." The statement has a familiar ring, but actually, it was made in 1900 by Dr. Keen.

The advances in medicine and medical education over the past fifty years are too well known to discuss. However, we are inclined to use these advances as an excuse for our difficulties. It might be well to examine this argument critically and to take lessons from the past; for there are lessons to be learned.

Two points I should like to emphasize particularly are, that our predecessors accomplished much on their own initiative. However justly proud we may be of our achievements, we would do well to recall that the founders of this Association trained good doctors. We are often inclined to be complacent about the superiority of our work to theirs, and to feel that this alone is sufficient reason for our needing more money. Most medical schools of the late 19th century operated on the proverbial shoestring; but with all their deficiencies, they established America in world leadership in medicine. The deans and their faculties realized they were dependent on their own efforts and that the very existence of the schools was determined by the success of these efforts. Many could not even rely on the aid of general university funds, since the schools were entirely separate organizations. Of course, students are receiving a better education today; but before we feel too superior we might recall the advice Victor Vaughan gave to this Association in 1902: "We must not satisfy ourselves with the thought that we are doing better work than our predecessors in medical education did, but we must seriously ask ourselves whether or not we are today doing all we should do. . . ."

Research costs have increased educational expenses tremendously and, of course, we can only have good faculties so long as we make adequate provision for research. I seriously question, though, the wisdom of carrying straight research projects on the educational budget and including them as educational expense. When research work is carried on entirely apart from teaching, I believe it should be financed separately. These special projects can be conducted very satisfactorily within the medical schools where they may have the benefit of all the general facilities, but I believe it is important that they have their own funds and add no additional burden to the teaching budget.

A grateful public, which has seen the medical miracles wrought in the

past two decades, has come to expect unlimited accomplishments from research. They are generous in their contributions and turn, as they should, to the university to solve their difficulties. This laudable effort, however, should not be chargeable to medical education, for there is no end to the costs if this formula is used. The same can be said of the enormous cost of patient care in our dispensaries and hospitals. It is an imposing item which should not be charged to medical education.

It is axiomatic that a patient cared for in a teaching institution receives the best that medicine has to offer. The experience of the Veterans Administration in the past few years is a clear example. Why, then, should teaching institutions be burdened by the cost of medical care to the indigent? It is not properly our financial responsibility. Rather, the public must be told of their obligation to support medical education and research since they are the ultimate beneficiaries. Alan Valentine has pointed out that the need in terms of national income is slight. He has been quoted widely for his statement that \$40,000,000 which would be adequate for our needs, is only one-fourth of what Americans spend annually for vitamin pills.

President Hancher has pointed clearly to several things this organization is obligated to undertake: The revaluation of the costs chargeable to medical education; The realization that public relations and education is one of our functions: A careful study of the medical needs of this nation, for what body is better able to determine the quantity and quality of medical personnel needed than those charged with the responsibility of turning out the product: and lastly, I would add the recapture of an important part of medical education which rightly belongs in the educational sphere—specialist training.

It is entirely possible that what medical education needs today is a race of versatile deans who make the most of what their community offers, who refuse to answer unauthorized questionnaires, who throw self-styled investigators out the back door, and who do not sit on the seat of their pants and yell to Washington for help.

In closing, I might suggest that, when we think we are in possession of an original idea, we thumb through past issues of our Journal. It will surprise us—and certainly will not inflate our egos.

Student Selection Problems*

ROUND TABLE A

CARLYLE JACOBSEN, State University of Iowa, Presiding

To initiate discussion, we started off by directing attention to two questions: One, what are we after when we attempt to select or identify or encourage good students to apply for admission to medical schools? Second, how do we go about identifying these desirable individuals?

Commenting on the first item, there was general agreement that we were anxious to secure individuals who would become able practitioners, and other individuals who would become teachers and investigators, at least to such an extent that we could maintain our teaching and investigative staff. We wanted, among other things, to find people who would be able to carry on the work of the medical school and minimize failures there, and state board licensure examinations. We hoped to find individuals who would maintain the high ethical standards and traditions of the profession, and, in line with that, we hoped to find individuals who would have awareness of social problems and the role of medicine in society.

There is not much dispute or argument about the desirability of these characteristics in the individuals we are seeking. But, as soon as we touched on the second question, we encountered much variation and deviation in points of view.

First of all, it was agreed that the prospective medical student was not a unique individual, as related to the desirable characteristics listed previously. Engineering, dentistry, the law, all of the professions, wanted this same kind of individual. Therefore, it was evident that we were not seeking the unique person. Likewise, the hospitals, in choosing interns, were calling for exactly that kind of individual, as were the admissions officers to undergraduate medical colleges. Therefore, it was a problem common to the educational hierarchy.

Then there was much discussion as to the devices or techniques to be used for identification of these individuals, touching on such items as the academic record, the medical college admissions test, the opinion of sponsors, the health and emotional stability of the applicant, and the role of interviews. Other topics were mentioned, such as the use of standard application forms, establishing a uniform date for closing of applications and acceptance of admissions. Certain restrictive factors, such as the geographic problem which confronts

*At the Sixtieth Annual Meeting of the Association of American Medical Colleges, held in Colorado Springs, Colorado, November 7-9, 1949, the program was set up in three divisions or sections designated as Round Tables A, B and C. To each of these sections, a subject or topic was assigned for discussion. The chairman was assisted by a group of assigned discussants but general discussion by attendants on each group was not limited. The chairman of each Round Table reported the results of the discussions in his group to the entire assembly at the last session of the meeting. These three reports are presented herewith. *Round Table A: STUDENT SELECTION PROBLEMS. Round Table B: LEADERSHIP IN CURRICULUM PLANNING. Round Table C: MAKING THE INTERNSHIP A PLANNED EDUCATIONAL EXPERIENCE.*

some state institutions, such factors as race, creed, color, sex, age of the applicant, were mentioned as factors that influence admission to medical colleges. Only briefly did we touch on the economic barrier.

I will comment rather briefly, perhaps too categorically to express properly the sense of the meeting, on some of these points. First, with respect to the academic record: I believe there was uniform agreement that the academic record, for all of its weaknesses, was still the best single criterion and the best single guide that we might have in the choice of a competent student. Likewise, it was agreed and emphasized that the appraisal of this academic record should always be flexible, at least flexible enough to permit evaluating special circumstances, such as the illness of the student.

Another matter was the slow start that some students make. Was it better to say, "Well, here's a chap who is in his Junior year, and he has really gotten going now, and let's forget the first two years." How could we work in some,—I would not say academic credit for extracurricular activity, but at least give it some weight in evaluating the quality and character of the academic record that is presented. By and large, there was a feeling that out of the academic record we wanted to show that the student had a certain minimal competency to carry on work of an intellectual character, and that beyond establishing that minimum, we perhaps should not be too concerned as to whether the student was a B+, a B—, an A or even a C student, if he demonstrated the qualities necessary to carry on such academic study.

In the course of commenting on the academic record, it was said again and again, "Well, we want the rounded man." There were varying ways of describing this individual, but obviously it was not a dullard who was wanted, but somebody who was interested in affairs of life, as well as the pure intellectual activity. Therefore, we came to a discussion of what we finally called these "intangibles." Then, the question arose, "How do you identify these intangibles?" There was quite a bit of sentiment in favor of having an interview in order to appraise some factors about the individual that were not reflected in the college record or in the medical college admissions test, but there was not uniform agreement on that point.

When we came to consider what the people do who conduct interviews, we found the greatest disparity,—and, perhaps, even the greatest amount of heat and loyalty to a particular technique. Some individuals said they had a man-to-man interview; that is, one interviewer, one student. Others followed the category of what we came to characterize as "three against one," three faculty members to one student. Others made it three against three. Sometimes it was man-to-man, three times over. Each one was relatively confident that what they were doing in their school was probably the best way to handle the interview, although there is always an "around the corner question," "Let's see what the other fellow is doing."

Another facet of the interview related to how much information should the interviewer have about the student before he sees him. There was a

range all the way from having complete information about the student, studying his record in its entirety, and using the interview to amplify and to evaluate some of the data that the student had already supplied; and at the other extreme, there were schools that said, "Well, we do not believe that the interviewer should have any information about the student beyond his name and that he would like to come to medical school." Again, you face the question of, "Are you trying to make independent judgments in an interview, or are you merely seeking to augment information that is already at hand?"

A question that received considerable discussion was, "What can we expect to get from an interview; what is a legitimate goal to set for an interview?" This was far from clear, but I think there was agreement that in an interview we had an opportunity to judge a man in action. We could determine how the individual related himself to one person or to a group of faculty members. We could get a sample of behavior, and base a judgment on that sample of the individual in action. We could determine, "How does he dress?" Although there were not a few men who said, "Well, is it important to make that judgment; will it be valid six months later, or at the time the student comes to school? Maybe even if he does not dress well, maybe if he does not quite have the niceties, we can help him through that in medical school, and we should not base too much of a judgment on that."

There was much discussion on both sides of the question as to whether it was appropriate that we seek from an interview a judgment on the basic integrity or the honesty of an individual. "Can we make a judgment on the basis of 15 minutes or an hour or three hours, as to how this individual is going to behave in some real life situation?" Perhaps, this question becomes even more acute when we consider that the interview is looked on by many students as a "trial by fire." He is very intent about getting into medical school, so he is ready to put his best foot forward, and if it is not a best foot, to screen that foot a bit. Anyway, he is going to put everything he has got, and maybe a little more, into that interview in order to get into college. Therefore, the faculty member, being astute, develops techniques to deceive the student who is being interviewed. So you have a contest between two individuals who are struggling, one to deceive the other. Are we to judge honesty and integrity in that situation? That is merely a paradox, and I do not have an answer to it.

I think we can sum up the discussion on the interviews by saying there was agreement that we could well afford to make some study and make some researches on the usefulness and most effective ways of conducting interviews in varying situations.

We turn next to, "How do we gather information from sponsors?" Here we had the benefit of Mr. Perkins, who came to us as a representative of one of the colleges to speak from the point of view of the supplier schools. In this discussion it became evident that we, as representatives of medical schools, by and large, have done a rather poor job of conveying to the advisors

in the colleges information as to what we expect in the way of the kind of student we want. They expressed the need for better information as to how they can help us. There was considerable discussion of techniques of improving this relationship, such as having a faculty member visit the school and talk with the faculty and meet with the undergraduate students, or to have the undergraduate students and their advisors come to a medical school and spend a day visiting there. That, obviously, was a point on which the technique would be adapted to the community, to the region, and to the character of the school and its purposes.

With respect to letters of recommendation,—they did not fare so well in the discussion. It was granted that there were good letters of recommendation, but a great deal of skepticism about the reliability of letters of recommendation was evident. Two suggestions stood out as to ways in which such letters could be made more useful. One was that a member of the medical college faculty should know personally, if possible, the individuals who write these letters. That might be accomplished by the medical school administrators' visiting the colleges and coming to know these individuals. The other suggestion was that a letter of recommendation is better if the individual submits not a statement that "This boy is energetic; he is a leader," but, "He is a leader"—and then give a little information that will characterize the way in which this chap is a leader, and the way in which the faculty has made the judgment that he is a leader. Then we turned to the use of form recommendations as a way of getting this expressed, and here we found a great diversity of opinion. There was general agreement that a faculty committee in the undergraduate college probably gave better judgments than a single individual, but the faculty committee was frequently pushed for time, and so you got a check list and marked them off. That left the medical college admissions officer without any good base for making a judgment. We came to no action on the matter of the form recommendation, and left it at that.

One further comment in relation to the undergraduate college: It was quite frankly expressed that medical colleges have been telling college advisors that we want men and women who are trained in the social sciences, and their answer is, "We will be delighted to send these individuals to you, and we will try to guide the students' program, as soon as you demonstrate and give us proof that those are the individuals you really want, and the only way you can do that is to select some students who have been majoring in English or history or the humanities, as well as in biology or chemistry." While it was pointed out that, "Well, we do that," the reply was "But you do not let us know about your having done it." Again, stressing the need for better communications between the two groups.

We discussed the medical college admissions test, and here, again, opinions ran the gamut from, "It is of no use," to "It is of very great use," in appraising the individual students. Yet, it was amusing that in one instance, at least, the individual who said it was of no use, or of very little use, imme-

diately turned around and said, "Now, this unuseful instrument is of great value to us, though, in appraising the relative quality of the several undergraduate colleges from which we draw our students." I think if we could sum up this section of the discussion, it would be as follows: That the medical college admissions test should not be overweighted in judging a student's qualifications for medicine, and that, as with the case of the academic record, it might be used as a minimal hurdle for admission, and then let the judgments beyond that point be based on other factors.

I want to comment on the matter of restrictive factors in admissions to medical schools. The great bulk of discussion centered around geographic restrictions, the problem of a school which wants to be a national institution, and how shall it distribute its admissions over the country, or its regional area, to achieve its goals. Then, on the other hand, the problem that confronts some of the state universities of coming to some kind of compromise between what I think most of them would feel a desirable educational goal, namely, that there be individuals from other than their immediate locale, with the reality that a legislative or municipal body is going to appropriate tax money to support the medical project, and they will want to know that their people are being served.

There were several discussions as to how this might be accomplished, including a suggestion that the state universities might establish a certain reciprocity between them so that a student would be taken from Iowa if Iowa took students from other areas. I think there are some suggestions that are well worth following through.

Finally, we discussed, among other topics, the use of a standard application blank. There were many desirable elements in the use of a standard blank, but I think it was also equally evident that the problems of using it were going to far outweigh, for the moment at least, the positive gains that might come from it.

I think I can express the feeling of the panel that the experiment with this type of a program was certainly of interest to them and that they enjoyed it, as did those who participated in it.

Leadership in Curriculum Planning

ROUND TABLE B

Prepared by

WARD DARLEY, M. D., University of Colorado

and

EDWARD L. TURNER, M. D., University of Washington

In the opinion of the panel it was felt that the most profitable manner in which consideration could be given to its assigned subject would be to take up a series of logical steps that could be taken up by the faculty of any school of medicine, in their proper sequential order. Because of time limitations, on the one hand, and the enormity of the subject on the other, both our introductory material and our questions were planned carefully so as to bring out as much constructive discussion as possible.

Ideally, any concerted study of the curriculum, with the view of instituting radical change, would be predicated on a decision on the part of the faculty that such change is indicated, and a willingness to give up whatever individual and departmental identity and time might be necessary. Since the willingness of a faculty to permit change and to make the sacrifices necessary thereto is more apt to result from than in the study of a new curriculum, many medical school administrators must think in terms of a three ring circus as they contemplate an active approach to the curriculum problem. At any rate, we must recognize that the degree to which any given faculty is ready for radical curriculum change varies markedly from school to school. Moreover, varying origins, traditions, resources and responsibilities of schools of medicine make it obvious at the outset that no two institutions necessarily will or should approach the curriculum question in the same way. The realization that the "take off" for curricular change in all medical schools is variable and that medical schools differ from one another in so many other ways added to the difficulties of organizing this panel. Consequently, for purposes of discussion, we pretended that we were a medical school faculty which had decided that radical curricular change was necessary. We were willing to surrender whatever personal or departmental identity was necessary to the end that a satisfactory curriculum would result and we were ready for the serious discussion necessary before the actual details of course organization and class schedules could be undertaken. Obviously, we were not able to follow through to the point of producing a detailed curriculum, but it was our hope that the "background" discussion could go far enough to stimulate the faculties of our member colleges to indulge in a very critical review of each curriculum, decide where revision is indicated and follow through with adequate and consistent action.

Our first session was concerned with a discussion of the aims and philosophy of the curriculum, the second with its content and scope and the third with its educational and administrative principles and methods.

I. FIRST SESSION

The Aims and Philosophy of the Curriculum.—The discussion was introduced by the following statement:

"Obviously there are limits to what we can hope to accomplish in the 4 undergraduate years. We realize that in this length of time the student can not be expected to master all of the factual information embraced by the entire field of health and medical activity. Since this is so, we are faced with problems that are concerned with the presentation of a minimum of carefully selected information, the acquisition of which will permit our graduates to pass the examinations required for licensure and to be reasonably safe practitioners should they elect to enter unsupervised practice upon the completion of the internship. Our problems, however, must be solved with the realization that, given the task of imparting a minimal and carefully selected amount of basic factual information, we must also play our part in developing a professional person capable of functioning far above any minimal level. It is this "extra mile" implied in education for the medical profession with which we are primarily concerned at this time and our questions are aimed at determining how far we can or should go."

The general question posed for the initiation of discussion was: What should be the basic aim and philosophies of the curriculum?

Discussion of this question resulted in the following summary:

"It was the consensus of the panel that the undergraduate curriculum should provide a basic or background educational experience that should be common to all physicians regardless of the type of professional activity to which they might ultimately restrict themselves. It was obvious from the discussion that as things now stand much is to be desired if we are to accomplish this objective. It was brought out that these objectives and the problems associated with attaining them were common to professions other than medicine; but it was generally agreed that the basic or background experience peculiar to medicine should be one that would take into account the fact that medicine's responsibility is rapidly being recognized as involving social and community leadership, as well as maximum effectiveness in the scientific and humanistic aspects of medical practice.

"Further, it was felt that this training should contribute much to the production of physicians capable of constant adjustment to a shifting scientific, social, economic and political world and that if we are to succeed in this to any great extent we must function so that each student develops an active and perpetual interest in medicine as a very comprehensive field of human endeavor—this, in spite of the fact that his actual professional activity must, of necessity, be restricted to a relatively narrow field.

"The general discussion brought out the fact that realization of these general goals were admittedly fraught with difficulty. In the first place, it was admitted that little could be accomplished by the use of didactic methods

or simply by adding formal courses to the already overburdened curriculum. The major difficulties which seem to be encountered are as follows:

1. Too limited perspective of individual faculty members frequently interferes with their own appreciation of the overall implications of professional responsibility.
2. Certainly in a profession such as ours, "precept by example" must be kept in mind as of major importance in the development of the student's ultimate perspective.
3. Basically, in view of items (1) and (2), it was implied that faculty orientation as to the overall implications of professional responsibility today is essential if we are to accomplish the objectives we consider to be so important.
4. It was the feeling of many of the discussants that students enter medical school with more idealism than they seemed to possess by the time of graduation. Discussion that had to do with the factors that might be responsible for this were of extreme interest:
 - (a) Pressures that result from the demands of the medical school curriculum produce serious socio-economic problems in the student's own environment, provide little time for reflective study and demand unreasonable physiological and social sacrifice.
 - (b) Financial pressures involved in obtaining a medical education, together with the constant stress which the profession places upon the economics of practice, potentiates the submergence of the idealism that was part of the student's original motivation.
 - (c) Of necessity the factors mentioned continue beyond the undergraduate phase of medical education and into the intern and graduate years.
 - (d) It was pointed out that medicine should be taught without ruining interests in other things and without destroying other talents.
5. Discussion indicated that one aid to overcoming these conditions would be through the integration of undergraduate experiences that would nurture and develop, instead of stifle, the idealistic motivation behind the student's decision to study medicine. For example, a field experience in the total care of individuals and their family units as they function as parts of a total community. The environment must be used in the teaching of environmental medicine.
6. It was obvious that there is a general dissatisfaction with the content and method of both premedical and medical education and that serious cooperative study is indicated so as to unload the curriculum of some unessentials and introduce teaching methods directed at correcting the present apparent faults."

Time did not permit a discussion of three questions which the panel con-

sidered of importance. These questions are inserted in this report for provocative purposes:

Should one aim of the curriculum be based upon the premise that all graduates will enter training for one of the specialties, or will be prepared to do a solo practice or both?

Should this same curriculum be so constructed as to provide the basic training necessary to medical scientists, teachers and administrators?

Should the curriculum contribute to the orientation of the student to health and the prevention of disease to a degree at least equal to his orientation to disease and its diagnosis and treatment?

II. SECOND SESSION

The Content and Scope of the Curriculum.—This portion of the panel was introduced with the following statement:

"Any curriculum must be planned with many limiting factors in mind. Obviously the number and magnitude of the limitations will vary from school to school. Quantitative problems that have to do with finances, space, equipment and number of personnel constitute a group of limitations that consume most of the time, energy and patience of almost every dean and department head. The activation of a new curriculum that is very different from the old will magnify these difficulties many times. Time, usually 32 weeks a year for 4 years, presents another quantitative limitation which will color a new curriculum and much of the discussion to follow. Qualitative limitations, many of them not appreciated until radical changes are being considered, are apt to restrict and distort the construction of a new curriculum. Tradition and administrative habits and attitudes may frequently throw obstacles in the way of progress. Since all teachers and administrators are human beings, it may well be that the resultant from apathy and keen interest, laziness and aggressiveness, selfishness and selflessness, rigidity and broadmindedness, and mediocrity and exceptional ability may prove to be very difficult limiting factors. But so that we may get down to business, let us concede that, while all of these limitations must be reckoned with, the limitation of time—so many hours a day, so many days a week and so many weeks a year—is the only one with which this panel is concerned. In fact, for the time being, let us go even further and once more resort to the play idea and pretend that there are no limitations to the setting up of a new curriculum and that we are free to proceed along very idealistic lines."

The discussion that had to do with the consideration of curricular content and scope resulted in the following summary:

"The afternoon panel discussion was centered around areas of the curriculum which were concerned with questions having to do with methods and with the amount of emphasis, time and material needed to stimulate an interest in and desire for knowledge in the following fields:

1. History of medicine	9. Public health
2. Medical sociology	10. Industrial medicine
3. Medical ethics and professional conduct	11. Physical medicine and rehabilitation
4. Medical economics	12. Biophysics
5. Medical jurisprudence	13. Anesthesiology
6. Statistics	14. Radiology
7. Growth and adaptation	15. Psychiatry
8. Preventive medicine	

"It was generally considered that all of these fields were important in the curriculum but that insofar as possible they should be integrated in a logical manner and in their proper relation to other course work. Insofar as possible, their consideration should be emphasized by demonstration and application—throughout all four years of the curriculum.

"It was emphasized that all of the above subjects lend themselves to the presentation of medicine as a segment of the broad field of human biology. The consideration of normality as well as abnormality, and the importance of the many facets of social adjustment in health and disease will then almost automatically fall into place.

"Statistics preferably should be adequately taught prior to entrance into medical school, and from then on handled by the various basic science and clinical departments in correlation with their interpretative teaching.

"While preventive medicine, public health and industrial medicine might require certain basic instruction, it was felt that these three subjects lend themselves particularly well to close integration with many of the preclinical subjects, and with almost all of the clinical subjects, and that by such integration large amounts of otherwise duplicated time can be liberated. The mere fact that preventive medicine continues to be considered as an isolated entity is a confession of failure to teach other clinical subjects properly.

"Physical medicine, rehabilitation and biophysics ideally lend themselves to a biological orientation and to the cutting across of departmental lines. The same is true of anesthesiology and radiology, both of which offer tools and philosophies that are basic to the teaching of both preclinical and clinical subjects.

"From the discussions it was apparent that psychiatry should be considered as one of the sciences basic to all aspects of medicine and therefore it should be on a par with other major clinical departments. The chief emphasis should be on undergraduate training in psychosomatic medicine. Furthermore, psychiatry is another one of the areas which lends itself ideally to integration. In fact, the clinical fields of medicine cannot be taught properly or adequately without such integration.

"A brief discussion was centered around the place of the medical and sur-

gical specialties in undergraduate teaching. It was felt that these phases of teaching, except for reasonable knowledge of diagnosis, belong primarily in the graduate years.

"It was intended to close the panel by consideration as to whether the time allocation between the clinical and basic medical sciences was properly balanced, and as to whether or not the general curriculum should be lengthened or shortened. Time did not permit this discussion but it was not felt that this was of any great consequence because if the principle of integration is applied properly, the considerations that have to do with these matters will more or less solve themselves."

III. THIRD SESSION

The Educational and Administrative Principles and Methods of the Curriculum.—This panel was introduced by the following statement:

"Any new curriculum, to be successful, may well depend upon the development or the emphasis of educational and administrative principles and methods that will represent just as radical a departure from the usual as does the new curriculum itself."

Educational Principles and Methods: "It is probably safe to state that with few exceptions the teachers and administrators currently active in medical education have definitely not been developed as the result of any deliberate or formal preparation in the fields of education or business administration. Perhaps this is not as bad as it sounds because the remarkable effectiveness of American medicine in itself is evidence that our medical educators have done their work well. Nevertheless, we cannot help but wonder if greater progress and an even better job might have been the result if the training of our teachers and administrators had been more specific as far as the application of their medical knowledge in their teaching and administration is concerned. It is generally thought that undergraduate instruction in medicine represents a teaching situation that does not have too much in common with the usual college and other professional educational set-ups. While such differences may exist and may be of importance, particularly those that stem from the clerkship and case methods of teaching, the existence of generally accepted and well understood principles of pedagogy in medical education is questioned by many—particularly educators who are outside of the fold."

This panel was introduced by posing the question: What are the pedagogical principles that do and do not apply in medicine, and how can such principles be integrated into a curriculum?

The summary of the discussion of this question follows:

"It was generally agreed that there are a few general principles which might be called pedagogical (educational) that can be applied in the medical program. It is logical that medical faculties rightfully are distrustful of principles that have been arrived at by teaching young children or by studying rats and other laboratory animals.

"Methods in teaching should be adapted to the maturity of the learner. We have largely failed seriously in this concept. Medical faculties are sinning by not recognizing maturity in their students. In fact, graduate schools, in general, sin seriously in this regard by placing too much emphasis on hours, credits, etc. Methods should be related to objectives which are desired. If, for instance, it is desired to develop a person who is capable of independent thought, one should go about education very differently than if the desire is to produce an automaton. Objectives, therefore, should tend to direct attention to the methods needed in achieving them.

"Methods also should be related to the characteristic abilities of teachers. It is felt undesirable to lay down inflexible methods for teachers; instead, in a mature pattern, great latitude should be allowed in methods of teaching. Actually, if a teacher is thoroughly excellent, he should be a person who has the capacity to be forgotten as the essential stimulus to learning. In other words, he should stimulate the student to become a self educator. This is of particular importance in the field of medicine.

"Furthermore, teaching should not be stereotyped for any group but should be related to the individual. There is need for uniformity to a minimum point, but any teacher should look forward to a variety of developments among the individuals in any one group. It is important that the perspective of the teacher should be that of the whole student just as the physician must deal in his perspective with the whole patient.

"Teaching should seek to produce fundamental changes in the individual. Simply studying for an examination does not do this. Educators in medicine should think in terms of the total environmental situations to which the students are exposed as presenting factors in bringing about the desired fundamental changes. Such statements as these are intended to be suggestive, and in no sense exhaustive."

Considerable discussion centered around such methods as the use of audio-visual aids and lectures in medical education. It was felt that at best such things as visual aids and lectures can be valuable adjuncts but can in no sense replace the need for the stimulation and leadership of the teacher as represented by his total personality.

"The place of research in undergraduate medical education was considered. This was not thought of as a requirement for all; instead, it should be offered to those interested in and capable of following through such lines of interest.

"The most useful thought in relation to the discussion concerning the place of examinations in the curriculum seemed to indicate that examinations are unavoidably a part of the program of evaluation but should never be used exclusively for such purposes. They are not merely for measurement of accomplishment, but should aid the student to evaluate himself, the faculty to evaluate the student and the faculty to evaluate the effectiveness of its program.

"The place of laboratory courses and laboratory work should receive

careful reevaluation. Such courses and work should add real meaning and significance and should be used to demonstrate points that cannot be emphasized in any other way. In general, too many unessential topics are covered in laboratory courses. Although the principle of learning by doing is sound, demonstrations, particularly now that small television units are in the offing, may well be developed to overcome these criticisms.

"Throughout the entire three panel sessions on Leadership in Curriculum Planning, there was a constant undercurrent indicating that one of the greatest problems in curriculum building results from inadequate communication among individual faculties in relationship to discussion and interpretation of their over all goals to each other. Better faculty communication would result in an improved experience for the medical student, whether it simply improves present curriculum or engages in building an entirely new one."

Administrative Principles and Methods: Time did not permit a consideration of this matter. For purposes of completeness, however, it is felt that the manner in which the discussion would have been conducted should be indicated.

It was planned to introduce the discussion as follows, and to ask the indicated questions:

"After the Curriculum Committee has threshed out the questions of aims and philosophy, scope and content, and educational principles and methods, all that is left to do is to find the means of building all of this into a program that is capable of administration. Thus, problems that are concerned with administrative principles and methods will assume a place of paramount importance and unless the committee is blessed with a strong sense of conviction, a wide range of imagination, a goodly amount of courage, a lively sense of humor and, perhaps, an inexhaustible supply of bourbon (laughter), the whole effort is apt to land on the rocks.

"From the first it should be obvious that if curricular time and the time and energy of the students and faculty are to be conserved so as to permit the intelligent selection of proper material from a veritable mass of possibility, correlation and integration of effort must be provided for in every possible way.

"The literature on medical curricula speaks of two types of correlation: vertical and horizontal. Vertical correlation represents a method whereby both the basic and clinical sciences are arranged according to the systems of the body. The horizontal type of correlation preserves a varying amount of the customary departmental grouping of curricular material but at the same time attempts to develop a correlation that is logical and that prevents unnecessary duplication.

1. From the administrative standpoint some type of departmental organization is essential. If a vertical type of curriculum is to be developed, should

the usual type of departmental organization be maintained or is something radically different indicated?

2. Can the vertical type of curriculum be developed from the teaching standpoint into something practical and effective?

3. If the horizontal type of curriculum or modifications are to be preserved, is our present type of departmental organization adequate or are radical changes indicated?

"Since some type of departmental organization will be required for either type of curriculum, it is essential that the curricular time be used as economically as possible and that we make the best possible use of faculty and departmental talent. The degree to which this will be accomplished will depend upon some effective type of interdepartmental integration and coordination. In all probability the best approach to the problem is through some type of overall committee government from which will stem whatever subcommittees may be necessary. We would like to hear discussion or a description of any such plans of organization—particularly of any that have seemed to be effective."

V. CONCLUSION

We offer the following statement as a final conclusion of our panel:

"In this series of panels we have endeavored to cover a great deal of territory—perhaps too much. Since this represents the most concerted attempt of this Association to stimulate positive and progressive curricular reconsideration, it seemed to us that this rather general outline type of consideration has been justified. It is our hope that as a result of the questions and ideas that have been discussed during the past two days, all of our member schools will give careful thought to the matter of their curricula to the end that the resources of each can be utilized in the most harmonious and effective manner possible in the solution of problems which all are facing. If the trite expression "education today for effective health service tomorrow" can be kept as our motto, we feel that much can be accomplished in the training of men and women capable of adjusting to the increasing complexity of the scientific, humanistic and social aspects of health and medical service, particularly as this service will constantly be bent and twisted by the powerful social, economic and political forces that will as constantly come at us from all sides."

Content of Medical Curriculum.—The question as to what shall be the content of the medical curriculum is an important one. I think the seven principal subjects still remain the background of medical education—anatomy, physiology, pharmacology, pathology, medicine, surgery and obstetrics with gynecology, but with the growth of medical knowledge so many subjects have been added which it is desirable to have represented in the medical school that at least we should furnish opportunities to students to study these subjects. It seems to me, therefore, that we must include in the curriculum not only obligatory courses but occasional or elective courses. (Wm. H. Welch, Johns Hopkins University: 20th annual meeting, Association of American Medical Colleges March 21-22, 1910).

Making the Internship a Planned Educational Experience

ROUND TABLE C

DR. JOHN B. YOUNMANS, University of Illinois, Presiding

This report represents the essence of the discussion of some sixty persons, which is about 25 per cent of the total registration, and does not include the repeated discussions by some individuals. The discussion centered broadly around not whether the internship is an educational experience, because it obviously is, but what kind it should be and how it should be accomplished. Illustrative of the inability to take out from its context one part of medical education, the discussion ranged over a broad field, from the consideration of curriculum and the teaching of medicine in the four years of the formal course to the types of practice in which our product is engaged. The outstanding development was the apparent increase in general practice internships, a considerable number of individuals reporting that either such internships had been introduced and were in operation, or that they were about to be introduced. Many other discussants were interested in that, with the idea of introducing it in their own places.

We have grouped together the points on which there seemed to be general agreement with regard to the matter of making the internship an educational experience; and then, following that, a number of points on which there seemed to be a divergence of views, sometimes an entirely opposite opinion. Among those points on which there seemed to be general agreement were the following: First, that a medical graduate should have not less than two years of hospital experience before entering practice. What exactly those two years will consist of will be developed later in this report. Second, the best place for this is in a teaching hospital and its affiliated hospitals, providing an adequate number of beds and patients, a proper proportion of acute and chronic cases, adequate variety of clinical material, and sufficient time for the intern to study his patient, and so forth.

Special provision was made for the intern to become acquainted with and to exercise the proper degree of consideration of the patient as an individual, so that he will not be required to do a disproportionate number of things which will not contribute to his education. He probably should take more responsibility for laboratory work than he has in recent years. There is some difference of opinion. We are approaching the subject from two points of view. The idea was that the intern should be relieved of doing things which should properly be done by someone else, but he must continue in his experience those parts of medical care for which he will be responsible. That, of course, will depend to some extent on what he intends to do and the type of internship.

This point was raised, particularly in connection with the general practice internship, in which it was pointed out that he will not have at his beck and call, as in the hospital of his training, the various things that were done by

technicians, and subsequently, he should continue to have enough experience in laboratory work so that he will properly handle it when he is out in practice and more dependent on his own efforts. The emphasis of the internship should be on internal medicine.

The first year of a two year service should be general in the experiences provided in order to get a proper foundation for subsequent concentration in preparing either for general practice or for specialization. There, again, the point was made that even with the general practice internship, there might be a division, with one group being trained particularly on what we might call for the moment, the medical side; and another group being trained on what we might call the surgical side. So that if group practice develops in connection with general practice, as there is some evidence that it will, we would be able to have two teams of individuals, each trained to handle the two major sides of general practice. The content of the internships should not be stipulated by state boards of medical examiners whose function is to determine the extent of knowledge and not how it was acquired.

In connection with the last, it was the opinion of the panel that that question should be tossed in the lap of the Association, as I am sure it has been in the past.

The treatment of interns by hospitals should not be a body and soul proposition, but living conditions—food, time off, vacations, ancillary services and the like should be adequate. In other words, there was objection to the slave labor aspect of internships, which has been expressed in the past, with which I am sure we are all in accord, and which, apparently, still exists to some extent. As a matter of fact, one discussant said that a good part of his internship consisted in doing things for the hospital which had no relationship whatever to his training.

Internship pay was not discussed to any extent, but there was an expression of opinion from two points of view. One is in relation to whether or not, or how much the internship is training and should be paid for, and how much is service for which compensation should be received by the intern.

The intern should not have excessive responsibilities toward patients admitted for diagnosis only, and that, again, refers back to the matter of quick turnover of patients, particularly in hospitals which have largely a surgical service, which does not permit the intern to acquire a fully rounded experience with regard to the diagnosis and the treatment of disease, and the care of the patient as an individual.

The intern should have access to all the patients in their service, and that, of course, again refers to the difficulty in conducting internships with a proper educational content in hospitals filled entirely with private patients, in which there are limitations on the responsibilities and duties of the intern, which mitigate against his getting a good educational experience.

The following questions and proposals were those on which there did not seem to be a consensus, and as I have indicated, in many cases on which there were opposite opinions expressed:

The proper division of responsibility between the clinical clerks, interns and residents. The fourth and fifth years are tending to be too much alike. As a result, the students show a let down when they begin their internship, especially if they have not been allowed to take on more responsibility than they had as clinical clerks. The opinion was expressed in that regard that we should, perhaps, eliminate interns and internships, at least in certain hospitals, particularly teaching hospitals.

How much responsibility should be assumed by medical schools for the graduate's fifth year? If full responsibility is assumed, it will be expensive and will require a lot of work. If the suggestion made by President Miller in his address is followed, namely, that medical schools assume complete responsibility for graduate and postgraduate medical education, this will involve a complete revamping of the financial and administrative setups of the schools. There, again, I think it was the feeling of the panel that this matter should be put back in the lap of the Association, with particular reference to the credit which is to be given for the internship, particularly the second and third years of extended internships, by such bodies as the specialty boards, if we are to make this an educational responsibility of the medical schools.

Limitation of internships to the 240 teaching hospitals or to those hospitals with full time and part time clinical staffs! There is evidence that good medical care can be provided without interns or with residents, although, in general, patient care is best where teaching flourishes. But it is not specified what the teaching must be. It is not necessary that it be intern teaching. It is not even necessary that it be resident teaching. As a matter of fact, one discussant reported a very interesting experience of a hospital which failed to get interns and was reduced to the necessity—and it turned out to be a very good reduction—of educating its own staff. The point was made, also, that one could, perhaps, use continuing education of physicians in this regard, so that although no one will dispute the fact that where teaching is carried on there is the best medical care, it is not necessary that we confine our teaching to any one segment of the profession.

Elimination of internships in teaching hospitals in favor of assistant residencies. This refers to the point which I mentioned a moment ago, the grinding of the internship between the upper millstone of residency, and the lower millstone of clerkship. Again, the residents would then have an hiatus of one or more years in their teaching hospital experience. We would have to draw on our residents from other hospitals in which the internship was served, with the need, perhaps, of a closer supervision of internships by those schools and by those teaching hospitals. In case that was done, what would be the effect of that on the attitude and habits of the resident staff and the students in those hospitals where there was no internship?

What should be the relationship of interns to the graduate school? This, of course, is more pertinent with regard to residents and fellows, but as I have already indicated, the decision, perhaps, of whether we are to make this actually a responsibility of the schools carried on through the residency, or whether we are to let it go as it presently is, remains to be decided.

How to defray the costs of supervision of internship in affiliated hospitals. The best programs have been at least moderately and many of them quite expensive. A figure of \$20,000 for the supervision of one affiliated hospital was mentioned. The question was raised as to where that figure showed up in the final analysis; was it on the little piece of paper that was handed the patient when he left or was it budgeted in some separate department? As a matter of fact, the question was not altogether answered; and in respect to that one experience, it was not quite decided whether it appeared as a cost of medical care or not. A figure in the neighborhood of \$50,000 a year was mentioned in connection with the supervision of internships in another group of hospitals, so that it is apparent that if we are to take over a larger measure of supervision of the internship as an educational experience, there will be a bill which someone will have to pay. How much of the cost of training is allowable in a patient's bill? The American Hospital Association at the present time is undertaking an analysis of the cost to the hospital with regard to its educational programs, and trying to allocate so much to service and so much to education, and there was given to the Chairman—although it did not arrive in time to be included in the discussion—a study of the cost of the internships in governmental services.

How much training in surgery is justified in the internship, and what should be its character? Emphasis to be on what the general physician should not do. This brings up, again, the matter of adjusting the internship to meet the requirements, and the undesirability of having rigid requirements such as are prescribed by many state boards because of the need to have internships to provide for the various types of places to which interns go. For example, in some communities and some areas the general practitioner must do at least some surgery, or at least it is believed he must do some surgery. It is believed in larger communities, such as Philadelphia and New York, that there is no general practice as we think of the term. For example, if one defines "general practice" as an internist who does some obstetrics and some emergency surgery, in many large communities there is no such person. On the other hand, in other areas there is need for more of the traditional type of general practitioner. Therefore, the content of the internship must be varied and must allow for the ends which we are seeking to attain when we are training these men.

What should be the role of the general practitioner in intern training? This, of course, dips down into the matter of the curriculum and the faculty, and the panel felt they could not discuss that without discussing what should be the

role of the general practitioner in the undergraduate training. They are much the same. It seemed to be the opinion that although the general practitioner was useful in presenting his experience and point of view, he should not be delegated in any measure the actual teaching of medicine or the actual care or the basic principles of care; rather, he should add to that teaching his experience. On that basis, it could be done to advantage both in the undergraduate training and in the internship.

The point was made about the amount of surgical training in the internship as to the loss of face which a practitioner might suffer in certain areas if he did not do some surgery. In other words, that was brought up as an argument for his getting a modicum, at least, of surgical training; and when I say that, I mean in addition to emergency care of a surgical nature.

The value of preceptorships, which again touches on the role of the general practitioner in this training of the intern, was discussed. It is being tried in several places. I thought one interesting aspect of it of a negative sort was the difficulty which was caused by selecting the practitioner to whom the intern was sent, the desire arising on the part of nearly every practitioner in the area to have an intern sent to him; and the difficulty in selecting those to whom one could send interns, keeping friends and not making enemies. That is an important factor to consider.

How to secure outpatient training for all interns? That goes back to the matter of the quick turnover and the possibility of picking out segments of the patients and the patients' care, and concentrating on them, without providing an opportunity for continued observation, for follow-up, and matters of that kind. Obviously, that is accomplished, or can be accomplished, at least to some degree, in hospitals in which there are outpatient services. It is much more difficult to do this in hospitals which do not have outpatient services. Actually, there are a considerable number of hospitals which offer intern training, and which do not have an outpatient service. It is obvious that unless that lack is met, there will be a deficiency in the training of interns with regard to that aspect of their training.

The Round Table did not reach any conclusion with regard to these matters. It was felt that this discussion will be presented to you, both here and in the report of the meeting, and that it will, perhaps, provide information with regard to what is being done in some places, suggestions as to what might be done, pitfalls, perhaps, to be avoided; and then we will present a considerable number of questions, such as those dealing with financing; whether or not we are to take a larger measure of control and supervision of internships from an educational point of view by medical schools.

Utilization of Regional Hospitals for Medical Education*

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Dr. Raymond Allen has stated: "It should be the aim of medical education to prepare . . . (the medical student) to fill this broader role as a responsible leader in the community, one who thoroughly understands the social, industrial, and economic patterns of which he is a part."¹ It would appear that in order to impress the student, the medical school should assume its proper share of community responsibility. In the not too distant past the medical school was a thing apart. It did not exist for the community nor could it be said to be of the community. Its support, for the most part, came from private endowment and tuition. This feeling was present even when some medical schools began to rely in part, and then in large part, on tax funds.

By the community to which a medical school belongs I mean a larger area than the specific city in which it is located. It could be that the community of a medical school is a region as large as a state. In some instances, it would include parts of several states. I grant that a medical school's community or region may be somewhat difficult to define in the strictest sense, but, on the other hand, I do not believe that many will misunderstand my use of this term.

In the past several years, many schools have adopted an attitude that the justification for their existence is dependent not only on their turning out well equipped physicians, but also, in no small measure, on their ability to keep the physician in their realm of influence, informed as to recent developments in diagnosis and treatment.

This brings to mind an entirely different institution from that commonly envisioned by many when the term medical school is used.

This medical school is not only active in the production of physicians, but also in maintaining their skill at a high level of efficiency. This trend is seen not only in tax supported schools. Many advances in continuation technique, and much of this philosophy of regional obligation, developed in privately endowed medical schools. Dr. Donal Sheehan has summed up much of this attitude in a book² that bears his "mark" even if it does not bear his name.

There are many ways in which this added obligation can be met. I shall

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discuss one facet of it, the place of the medical school in relation to the hospital in its region of influence.

It has been said that all hospitals are teaching hospitals, in that they teach either good or bad medicine. It might be said that all medical schools have a regional obligation which they either do or do not fulfill. It is my belief that a hospital functions effectively in discharging its obligation largely in proportion to its activities in the field of medical education. This belief is held by many, and as a result, during the past several years many attempts have been made to integrate the local hospital as an educational institution with the medical school as the center of regional medical education.

For a period of time I was intimately involved in the program at the University of Michigan that attempted to do this. It was by no means unilateral. The need of hospitals for many of the things to be found only at a university center was equalled by the need of the university for the hospital's facilities and staff in the training of interns and residents. As a result a program was developed which it was hoped would not only give good intern and resident training in hospitals distant from the medical school, but would also serve as a daily stimulation to the continuing education of the physicians practicing in the areas served by those hospitals.⁸ It was hoped that this program might demonstrate one way that a medical school could become truly regional in both graduate and postgraduate fields.

It was realized that no static plan was likely to succeed, and rather than start with a plan that was not flexible, it was thought best to have a program that could, within rather wide limits, be changed as its faults became apparent or as the need varied. There were, however, certain broad principles which served to set the course of this program and which are believed to hold true in the continuous education of any physician.

1. Medical schools can no longer hope to prepare an individual for the practice of medicine for more than four or five years after graduation.
2. A physician can continue his own education, but this is not likely to be the most efficient method by which his skill can be maintained.
3. A medical school's primary obligation is to the undergraduate, but scarcely less important is its obligation of educating residents and practicing physicians.
4. This is especially true of tax-supported institutions in their relation to the practicing physician.
5. A medical school's influence should, wherever possible, be carried to the physician, as well as offering more formal training on the campus.
6. Short courses are valuable but do not obviate the need for planned day-by-day stimulation.
7. The best place for this day-by-day stimulation is in the hospital where the physician practices.

8. Ideally, the practice of medicine should be made up of three components: (a) The care of the sick. (b) Teaching of undergraduates, residents, or other physicians. (c) Some type of investigative work.

The definition given above for the ideal practice of medicine is open to some criticism. Indeed, it has been criticized by some of my close friends. "Where?" they ask, "is preventive medicine included in your definition?" I find myself at a loss to answer this question. Certainly, the physician of today should be acutely aware of preventive medicine and I am inclined to agree with my critics that the care of the sick should be broadened to include the prevention of disease.

A hospital that desired to affiliate approached the university and stated such a desire and was visited by the coordinator of the decentralized program. They were acquainted with the basic teaching requirements of the program which were:

1. Teaching ward rounds conducted daily.

2. X-ray conferences in each affiliated service weekly.

3. Clinico pathological conferences which may alternate between medical and surgical cases weekly.

4. Clinical conferences by the medical service, and clinical and necropsy review conferences by the surgical services.

5. Responsibility during the surgical resident's fourth year for a fifteen to twenty bed ward or its equivalent.

6. Each chief of service was either a diplomate or a fellow of his respective board or college. When this requirement could not be met, a member of the staff with the above requirements could be selected from the service to act as preceptor.

In addition, the university sent members of the senior faculty to the affiliated hospitals to participate in ward rounds and conferences once each month in medicine and surgery.

During the third year out of medical school, or the second year in specialty training, the resident came from the affiliated hospital to the University of Michigan to spend either a year or nine months in the study of the basic sciences closely correlated with clinical application. During this period, approximately two-fifths of the resident's time was spent in clinical application while the remainder was spent in the basic science departments.

The basic science programs were outlined with the primary objective of presenting them to physicians who had progressed to the point of resident in a specialty program. They are not merely reviews of sophomore courses, neither are they courses designed for graduate students; they are organized specifically for physicians who have reached a definite point in their educational development.

During the period from October, 1946, to October, 1948, there were about seventy-five residents at the University of Michigan in the Basic Science Continuation Program from fifteen affiliated hospitals. Some of these men chose to spend twelve months while the remainder were in attendance for only nine months. Those who stayed for the extra three months had special clinical training or anatomical dissection.

It has been gratifying to speak with residents who have returned to their home hospitals to finish their period of training, as well as to their superiors, and learn that, in most instances, all concerned felt that the year had been extremely worthwhile.

The basic science part of the program has been altered somewhat to meet criticisms from participants as well as faculty members, based on the experience of past years. The visiting program referred to above has been enlarged, and it is now a standard adjunct in the decentralization of resident training. It is felt that through this affiliated program, some residencies, already excellent, have been improved, and it has made possible the approval of other residencies by the various certifying boards and bodies.

For some time it has been evident that there is need of a special program for the training of general practitioners. After consultation with many prominent practitioners throughout the state, the Council on Education and Hospitals of the American Medical Association, and the Michigan State Board of Registration in Medicine, the following program was planned, and went into operation July 1, 1948. Two hospitals were affiliated with the university for the training of general residents. There were two interns and there will be two general residents on duty at each hospital. In addition, there will be two interns at the University Hospital for each of the two affiliated hospitals, making a total of four, who will after six months rotate with the two interns at the affiliated hospital. This will mean that eight interns, during a period of one year, will have six months' training at the University Hospital and six months' training at one of the affiliated hospitals.

ROTATION

First Year

UNIVERSITY HOSPITAL

- 2 months medical wards
- 2 months dermatology (outpatient)
- 2 months surgery (outpatient)

AFFILIATED HOSPITAL

- Will be divided into medicine (to include obstetrics) and surgery (to include gynecology) services.
- The intern will spend 3 months on each service

Second Year

UNIVERSITY HOSPITAL

- 2 months neuropsychiatry (outpatient)
- 2 months pediatrics
- 2 months obstetrics and gynecology

AFFILIATED HOSPITAL

- The general resident will spend three months on each service as during the preceding year but with increased responsibility

Third Year (Optional)

UNIVERSITY HOSPITAL

- 4 months medicine (outpatient)
- 4 months surgical wards

The remaining 4 months will be spent under one of the board men in surgery at the affiliated hospital.

A resident in internal medicine or a resident in surgery changes every three to six months, so that over a period of a year there will be several men from the above mentioned services at the University Hospital, rotating through the affiliated hospitals. These men will act as teaching residents, and will aid in the preparation of conferences, et cetera. Each affiliated hospital was expected to conform to all of the basic requirements asked for affiliation in the Decentralized Resident Training Program in the Specialties.

I have gone into such detail in the Michigan Programs because of my close association with them. You must remember that these two programs were an attempt to meet a specific need. In many places the need is different and local conditions will dictate a different approach.

It has been suggested that I mention the cost of the two programs I have just described. They were initially started by grants from the W. K. Kellogg Foundation and operated on a budget of between \$30,000 and \$40,000 per year, depending chiefly on the size of the visiting program. About a year and a half ago, I calculated that if the cost of the program was broken down on the basis of individual participating hospitals, the entire budget could be carried at a rate of about eight cents per bed per day.

No doubt this cost is different at the present time. Whether more or less I am not in a position to say. It would, I believe, represent an extremely minute fraction of the daily cost to a patient in one of the affiliated hospitals. It can readily be seen that such programs as outlined have a more or less constant expenditure and that the variation from this would be almost entirely dependent on the size of the visiting program. The more hospitals participate in the programs the less the cost per bed per day would be, up to a certain point.

There are many schools that have developed programs that have combined the need for daily postgraduate training and resident education. Some of these are the programs developed at Tufts College Medical School, the University of Colorado Medical School, and the New York University Medical School. These are by no means all.⁴

Looking at these various programs one would not see much similarity at first, but it is there. All of these schools have attempted to meet regional needs by using existing facilities, or modifications of existing facilities. They have many difficulties in common. Among these are:

1. Lack of faculty.

2. The vexation of extra duties added to an overcrowded schedule.
3. Frequent lack or apparent lack, of appreciation of the time given to the program by the medical school faculty.
4. The difficulty of finding the right man to head up the program in the affiliated hospital.
5. The occasional, but understandable, feeling on the part of the local group that the "university has moved in."

In addition to the general difficulties outlined above there were a number that were unique to the programs at the University of Michigan, or at least, appeared to be.

1. It was not uncommon for a senior staff man who had completed a visit to an affiliated hospital to feel that the time he spent there had been more or less wasted. On that particular day the attendance at his conferences may have been small or there was little use made of his recognized ability as a consultant.
2. The reverse was sometimes the case and the group at the affiliated hospital felt that the visiting professor from the university was talking down to them or that the wrong man had been chosen to present a specific problem.
3. In at least two instances, it was difficult for the professional and administrative staff of the hospital to convince the Board of Trustees of the necessity of paying stipends to residents while they were away from the hospital.
4. There was the occasional resident who antagonized one or more members of the faculty of the university either through his lack of understanding of the time and thought given to his training or to his inability to get along with other members of his group or with members of the faculty.
5. At times interest appeared to lag temporarily on the part of the affiliated group. This was usually associated with a decrease in supervision, and resulted in poor records and decreased interest on the part of the resident.
6. It was inevitable, with a program involving so many institutions and individuals, that personality clashes would occur. I honestly feel, however, that these have had little effect on the programs described and were kept to a minimum that was both gratifying and surprising.

I am certain that many who have come in contact with such programs might mention many more pertinent drawbacks. All of the schools engaged in such programs have their troubles. I know of no such program that is as good as it was planned to be. These inherent faults are important, but to me they are not as significant as are the advantages; namely:

1. Hospitals far removed from university centers have been able to conduct improved intern and resident programs.
2. Many medical schools realize that to obtain their full growth they must expand beyond the campus and its ivory towers.

3. Practitioners not in a university center may have the stimulation that comes from teaching.

4. A valuable adjunct has been added to established procedures that enable the busy practitioner to continue his education. Teaching centers have been set up at a number of points distant from the medical school. These can give a day-by-day stimulation to the continued education of the physician practicing in that area and augment the short courses offered at the medical center. To me, this is equally as important as the training of residents in these areas removed from the medical school.

I am one of many who believe that intern and resident training has become too complex to be considered merely as a work experience. It is part of the physician's education, and should be under the supervision of medical schools. If you will grant this, I am certain you will agree that the need for some type of affiliated resident program becomes evident. No one would presume that the medical school alone could assume the responsibility for training all residents within its walls. It can, however, through affiliation with regional hospitals, expand not only the number of residents for whose education it is responsible, but at the same time participate in a truly regional medical educational program.

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A Comparative Evaluation of the Professional Aptitude Test* and the General Aptitude Test Battery

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The problem of the proper selection of medical students from the ranks of applicants has long existed. This problem has been intensified in recent years because of the increased number of applicants desiring admission. Zapffe's periodic summaries of studies on medical school success, appearing in this Journal, indicate a steady decrease in the percentage of failures—yet the number of casualties remains distressingly high. Also, some of the students not selected probably would have been quite successful.

Many attempts to predict achievement in medical college have been made with varying degrees of success, but as yet no sufficiently valid set of selection instruments has been developed. With the increase in the number of applicants, it is probable that a greater qualitative variation exists among the candidates; therefore, the task of selecting those best fitted for medical training and of eliminating misfits at the earliest possible moment becomes increasingly important. It is hoped that the present study will provide further insight into this selection problem and contribute one means of differentiating the best available prospects from the poorer ones.

In 1946, the Moss Scholastic Aptitude Test was discarded by the Association of American Medical Colleges in favor of the new Professional Aptitude Test (PAT). Rejection of the Moss test was brought about mainly by the small validities found in various studies of its predictive efficiency. Typical of the results obtained are those of Stuit, who reports validities in several studies ranging from .226 to .316.¹ Hurd reported validities of .28, .14, and .04, respectively, for high school grades, the Moss test, and a local medical literature reading test when correlated with the grades of 67 students at the Medical College of Virginia.²

The Professional Aptitude Test has been evaluated by Young and Pier-
son on 50 freshmen medical students. These investigators reported that only the science achievement items were significantly related to success in medical studies as measured by first quarter grades. Their results show the highest validity obtained for any part of the PAT to be .24 as compared to a validity coefficient of .44 for Form I of the Moss test and one of .50 for marks earned in premedical science courses as a predictor of first quarter medical success. They conclude that although the Moss test is superior to the new PAT,

*Since October 30, 1948, the name "Professional Aptitude Test" has been changed to "Medical College Admission Test."

1. STUIT, DREWY B.: "The Prediction of Scholastic Success in a College of Medicine," *Educational and Psychological Measurement*, 1: 77-84 (1941).

2. HURD, ARCHER W.: "Implications of a Brief Study of Prediction of Success in the Medical School, Medical College of Virginia," *Educational and Psychological Measurement*, 8: 127-131 (1948).

premedical science course grades remain the best predictor of success among medical students.³ In an unpublished study, Travers, of the Psychological Services in the Institute of Human Affairs at the University of Michigan, reported validity coefficients for the seven parts of the PAT ranging from .03 to .26. These results very closely approximate the results of the present study in which the validity coefficients varied from —.06 to .26. The present investigation was conducted on the same group of medical students studied by Young and Pierson, but the criterion of success was over the first five quarters instead of only the first quarter, as used in their study. Also, six students from their sample had dropped out of medical college before the end of the fifth quarter.

An unpublished study conducted by the University Examinations Service of the University of Iowa showed somewhat higher validities for certain parts of the PAT. The validity coefficients for the PAT, 1947 Form, in the four cited studies are presented in Table 1.

TABLE 1.—VALIDITY COEFFICIENTS FOR THE PROFESSIONAL APTITUDE TEST.

Test Score	Young and Pierson	Present Study	Travers	Iowa Study
Scientific Vocabulary	.23	.17	.21	.38
Social Vocabulary	—.08	.07	.05	.25
Humanistic Vocabulary	—.22	—.06	.03	.21
Composite Verbal Ability	—.10	.06	.10	.35
Quantitative Ability	.19	.16	.23	.17
Index of General Ability	.02	.08	.15	.34
Premedical Science Achievement	.24	.26	.26	.48
Number of students sampled	50	44	102	81

Similar to the findings of Young and Pierson, the Iowa study indicated that the grade point average in premedical science work with a validity of .55 was a better predictor of first year medical success than was any part of the PAT. It was also found that, in general, the PAT correlated higher with grades already attained in premedical sciences than with the subsequently achieved success in the first year of medical college.

It is interesting to note that the low validities and other findings in these investigations suggest that it is probably not advisable to utilize all the parts of the PAT as predictors of success in medical studies. Furthermore, it is obvious that the same amount of testing time required for the PAT could be more profitably spent if better predictors of medical success could be found.

THE GENERAL APTITUDE TEST BATTERY

The experimental test battery used along with the PAT in this study was the General Aptitude Test Battery (GATB) developed for use in employment office counseling programs. The battery was designed "to measure several aptitudes which have been found important for success in many occupations. This information, along with other information gathered about an

3. YOUNG, RICHARD H., and PIERSON, GEORGE A.: "The Professional Aptitude Test, 1947, a Preliminary Evaluation." *J. A. A. M. Colls.*, 23: 176-179 (1948).

applicant, assists the counselor in guiding the applicant into a field of work in which his qualifications compare favorably with the occupational requirements of that field."⁴

Although apparatus tests to yield scores on the manual and finger dexterity aptitudes were excluded in companion GATB studies in other academic areas at the University of Utah,⁵ it was felt that sufficient face validity existed to suggest the inclusion of these aptitudes in the study of medical scholastic success. These aptitudes were therefore included and the battery of eleven aptitudes was used in its entirety.

The ten aptitudes currently used in employment office counseling programs are defined as follows:

Intelligence (G)—General learning ability. The ability to catch on or understand instructions and underlying principles; the ability to reason and make judgments. Closely related to doing well in school.

Verbal Aptitude (V)—The ability to understand meaning of words and ideas associated with them, and to use them effectively. The ability to comprehend language, to understand meanings of whole sentences and paragraphs. The ability to present information or ideas clearly.

Numerical Aptitude (N)—Ability to perform arithmetic operations quickly and accurately.

Spatial Aptitude (S)—Ability to comprehend forms in space and understand relationships of plane and solid objects. May be used in such tasks as blueprint reading and in solving geometry problems. Frequently described as the ability to "visualize" objects of two or three dimensions, or to think visually of geometric forms.

Form Perception (P)—Ability to perceive pertinent detail in objects or graphic material. Ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.

Clerical Perception (Q)—Ability to perceive pertinent detail in verbal or tabular material. Ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation.

Aiming or Eye-Hand Coordination (A)—Ability to coordinate eyes and hands or fingers accurately so as to make precise movements with speed. Ability to control rapid movements of the hand in accordance with what the eyes see.

4. DVORAK, BEATRICE J.: "The New USES General Aptitude Test Battery," *J. Applied Psychology*, 31: 372-376 (1947).

5. For a summary of current research on the GATB, see *Employment Security Review*, 16, p. 19 (March, 1949).

Motor Speed (T)—Ability to make hand movements, such as tapping, rapidly. Ability to make a movement response swiftly and quickly. Probably related to reaction time.

Finger Dexterity (F)—Ability to move the fingers, and manipulate small objects with the fingers, rapidly or accurately.

Manual Dexterity (M)—Ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions.

The eleventh aptitude, which is not usually administered by employment offices, is designated Logic (L) in USES factorial studies. The logic aptitude may be described as the type of reasoning ability required to determine rapidly the plan of a letter series and add the next letter appropriate to the sequence.

The development and standardization of the GATB was a long range project of the Employment Service in which more than 100 tests were reduced, mainly by a series of factorial analysis studies, to 16 tests which measure the 11 aptitudes. Most of these 11 aptitude factors were well known, whereas some factors had not received previous attention in the psychological literature.

On the basis of data from standardization samples of workers, conversion tables were set up to yield aptitude scores, each having a mean of 100 and a standard deviation of 20. The battery was validated for 20 different occupational families constructed on the basis of some 2,000 occupations obtained from the Dictionary of Occupational Titles. An aptitude pattern of scores was developed across the aptitudes found to be most significant for each of the 20 occupational families. One purpose of the present study was to extend the usefulness of the battery by determining the aptitude pattern needed for medical training.

In order to discover if the GATB is a valid instrument for selecting medical students, it was necessary to develop a criterion of success, select a sample on which criterion scores could be obtained, test that sample, and evaluate the results to determine if the battery identified the more successful students from the less successful ones. Inasmuch as the battery was to be used to predict medical academic success, it seemed wise to select subjects from within the medical college. The sophomore class was readily available and had completed sufficient work within the college to afford measurable degrees of success; hence this group was selected as the experimental sample. With the exception of five persons all of the forty-nine sophomore students enrolled during the Spring Quarter, 1948, had been selected for medical training partly on the basis of their performance on the Professional Aptitude Test.

The grade point average obtained in the five completed quarters of medical studies was selected as the criterion of success. The range of grade point averages for the sample was from 0.98 to 2.93 with a mean of 1.72 and a standard deviation of .47.⁶ The range is restricted to the upper half of the

⁶ In this grading system, hours of A are each given a value of (3) points, hours of B (2) points, hours of C (1) point, hours of D (0) points, and hours of E (-1) point.

grading scale since no student with an average below 1.00 at the end of each academic year is allowed to continue his medical studies.

Aptitude scores were obtained for each student from the raw scores on the parts of the GATB. The means, standard deviations, and validity coefficients that were computed for the aptitude scores are listed in Table 2.

TABLE 2.—VALIDITIES, MEANS, AND STANDARD DEVIATIONS FOR THE GENERAL APTITUDE TEST BATTERY.

Score	Validity Coefficient	Mean	Standard Deviation
GATB:			
Intelligence (G) .....	.47	149.0	11.9
Verbal (V) .....	.45	137.6	14.4
Numerical (N) .....	.39	132.6	12.8
Spatial (S) .....	.41	128.0	10.7
Form Perception (P) .....	.12	126.3	13.7
Clerical Perception (Q) .....	.14	123.0	20.0
Logic (L)	-.06	129.1	11.7
Aiming (A)	-.15	107.2	23.8
Motor Speed (T) .....	.01	98.9	25.5
Finger Dexterity (F)	-.01	97.5	16.6
Manual Dexterity (M)	-.06	100.8	20.9
Criterion:			
Grade Point Average .....	...	1.72	.47

The multiple correlation method used for selecting an appropriate set of aptitudes from the GATB was the Wherry-Doolittle Method of Test Selection.⁷ Even though this method has corrections which tend to reduce the number of aptitudes selected, eight of the eleven variables were chosen. The eight selected aptitudes, in the order of their appearance, were Intelligence (G), Spatial (S), Numerical (N), Verbal (V), Logic (L), Finger Dexterity (F), Manual Dexterity (M), and Clerical Perception (Q).

It was felt that the obtained multiple correlation coefficient of over .60 for this long battery was artificially high and probably would not be nearly so large in future studies. Some of the aptitudes that were included had low validities. The means and standard deviations on other aptitudes approximated those obtained on the norm population so that a high level on these aptitudes would not be clearly needed to succeed in medical studies. Also, the Intelligence aptitude overlapped to a great extent the Numerical, Spatial, and Verbal aptitudes, thus allowing suppressor effects to occur. Therefore, it was decided not to include the Intelligence aptitude and to eliminate other aptitude measures that had either a low validity, a low mean, or a large standard deviation.

After this initial thorough elimination process four aptitudes remained, namely, Verbal (V), Numerical (N), Spatial (S), and Form Perception (P). All of these aptitudes had significant validity coefficients, means from 26 to 37 points above the standardized mean of 100, and standard deviations between 10.7 and 14.4 as compared to the standard deviation of 20 for the norm group.

7. STEAD, W. H., SHARTLE, C. L., ET AL., *Occupational Counseling Techniques*, (New York: American Book Company, 1940), appendix 5.

If the mean aptitude score is significantly higher and the standard deviation significantly smaller for a sample of medical students than for the original standardization group, then the medical student sample is homogeneous at a high level of the aptitude. This provides one indication that scores in that aptitude are probably related to success in medical school.

From a second Wherry-Doolittle computation performed on these four aptitudes there emerged a final short battery of three aptitudes. In the order of their appearance these were Verbal (V), Spatial (S), and Numerical (N).⁸ This three-aptitude battery can be administered in less than 45 minutes, of which 29 minutes is actual testing time. A multiple correlation coefficient of .55 with a standard error of .11 was derived from this battery. The shrunken multiple correlation was .52. The fourth aptitude did not add enough validity to the combination of three to be retained.

Multiple regression weights were assigned to the three aptitudes to form the prediction equation below. This equation yields a best predicted grade point average for the grading system used at the University of Utah.

$$Y' = (.00704) X_V + (.00848) X_S + (.01135) X_N - 1.8728$$

Y' = Predicted grade point average,

X_V = Aptitude score in Verbal Ability,

X_S = Aptitude score in Spatial Ability, and

X_N = Aptitude score in Numerical Ability.

The standard error of estimate is 0.40, indicating that in approximately 68 per cent of the cases, the *actual* grade point average achieved by a student in his first five quarters in Medical College would be expected to fall within plus or minus 0.40 points of the *predicted* grade point average. The multiple correlation coefficient of the three-aptitude battery indicates that 30.25 per cent of the variance in the criterion is accounted for by the aptitudes measured, which, in comparison with findings obtained in other studies, is satisfactory for predictive purposes. A correlation coefficient of .41 is considered necessary to indicate that there is not greater than 1 per cent probability that a three variable multiple correlation with a sample of forty-nine individuals is a chance relationship. Therefore, the obtained multiple correlation coefficient of .55 is considerably above the very significant correlation level.

The method of testing persons who have completed some training and on whom criterion scores of success are already available is frequently utilized to make a rapid evaluation of aptitudes. When this method is used, as in the present study on the GATB, it is highly advisable to conduct additional studies, particularly of the follow-up type, in order to check the results of the initial study. In the follow-up type of study, persons are tested prior to training and are then followed up to ascertain their eventual degree of success in training. The evaluation of the aptitude test is made by correlating the aptitude scores with the subsequently attained scores of success in training.

⁸ The intercorrelations between these three aptitudes were .44 between V and S; .45 between V and N; and .23 between S and N. Because of overlap, it is possible to obtain the G score as well as the V, S, and N scores for each person when all the tests in the three-aptitude battery are administered.

Thus, studies on other samples of medical students should be undertaken to see if the three-aptitude battery is consistently valid. In the present study the larger validity coefficients for the three-aptitude battery suggest that it may be better than the PAT for the selection of medical students.

The medical school applicant population on which the PAT was standardized had a mean score of 500 and a standard deviation of 100 on each PAT subtest. For the medical student samples in the four studies cited, the means on the various parts of the PAT ranged, in general, from approximately 530 to approximately 590 and the standard deviations were nearly all between the low 70's and the high 80's. Although no direct comparison is possible because of different standardization populations, it can be seen from the GATB results presented in Table 2 and from the above results that there is some restriction of range and subsequent effect on the size of validities on the three aptitudes of the GATB as well as on the parts of the PAT.

If further studies indicate that the three-aptitude battery is consistently valid, for best results in selecting medical students it should be used in conjunction with other valid selection methods. Care should be taken, however, to include only valid instruments in order to prevent the possible reduction or nullification of the predictive efficiency of instruments with established validities. For example, certain parts of the PAT which appear to be invalid probably should not be used in medical selection programs because they may reduce the efficiency of more valid parts. Inspection of Table 1 indicates that this undesirable reduction of validity occurred in deriving both the Composite Verbal Ability and the Index of General Ability scores from the parts of the PAT. The Composite Verbal Ability score is obtained by combining Scientific Vocabulary, Social Vocabulary, and Humanistic Vocabulary scores; and similarly, the Index of General Ability is formed from these three vocabulary scores and the Quantitative Ability score.

The sound procedure is to evaluate each proposed instrument or technique in a fashion similar to the one prescribed for the aptitude battery in this study. The evaluation should include the all important check studies on other samples. Also, any new measure should validly predict some aspect of success that is not already included in the battery of established validity.

It is evident that, since the three-aptitude battery accounts for only 30.25 per cent of the variance in the criterion, the efficiency of this battery could be greatly enhanced by including other valid measures of additional aspects of medical academic success. Intensive case studies on medical students who drop out and also on those who are highly competent may result in the identification of other important factors in success that are not yet adequately measured in medical selection programs.

It should be noted that the three selected aptitudes have been isolated and measured by other investigators prior to the development of the GATB. If these three aptitudes prove to be consistently valid in further studies, it would be worthwhile to build parallel forms of the appropriate tests for use in med-

ical selection programs. With new parallel forms available for measuring these three aptitudes, the use of the present form of the battery could still be restricted, in accordance with present practice, to counseling programs.

SUMMARY AND RECOMMENDATIONS

In the only direct comparisons available it appears that the Professional Aptitude Test as a predictor of medical scholastic success may be inferior to both the discarded Moss Scholastic Aptitude Test and the short three-aptitude battery derived in the present study. Most of the parts of the Professional Aptitude Test have zero or negligible value as predictors in the four studies mentioned. The validities for the other parts are generally low across the studies, thus pointing to the conclusion that although one or two parts show some validity, the Professional Aptitude Test viewed as a whole seems to be of doubtful value and may not be worth all the testing time or other expense required.

The three-aptitude battery composed of the Verbal, Spatial and Numerical aptitudes of the GATB shows promise of being an efficient predictive instrument for use in the selection of medical students. Further investigations, particularly of the follow-up type, should be undertaken to check the validity of this predictive battery on other samples before applying it to medical selection programs. Check studies could also be made on both the three-aptitude and the eight-aptitude batteries derived from the GATB to determine their relative accuracy of prediction on subsequent samples. At present in the interest of simplicity, stability, and economy, the three-aptitude battery seems preferable. The multiple correlation coefficient for this short battery is sufficiently high to suggest that it is useful as a prediction instrument in both selection and counseling programs.

The relationship between the three-aptitude battery scores and other scores which have significant predictive value, such as the grade point average in premedical science courses and the Premedical Science score of the Professional Aptitude Test, should be investigated. Furthermore, the particular combination of these scores that will yield the maximum validity should be determined so that the best composite battery of valid measures can be available for use in medical college selection programs.

The Teaching of Gross Anatomy in the Medical Schools of Mexico City

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In the summer of 1948, while in Mexico on an anthropology field trip sponsored by The Viking Fund and Wayne University, I visited the departments of anatomy at the Universidad Nacional Autonoma de Mexico and the Escuela Medico Militar in Mexico, D. F. At both institutions, I became acquainted with several members of the faculty, all of whom were kind and generous in showing me about the university.

The larger and older of the two schools is the Universidad de Mexico, which has a long and distinguished history, dating back to the Real y Pontificia Universidad de Mexico, founded January 25, 1553, by Don Antonio de Mendoza, first Viceroy of New Spain. At present, the various schools and divisions of the university are scattered about Mexico City, but plans are under way for a new campus in the suburbs.

The Facultad de Medicina was established November 7, 1582, as the Prima de Medicina in the Real y Pontificia Universidad and is located in the Plaza Santo Domingo just a few blocks from the Zócalo. This is one of the oldest sections of Mexico City. The medical school building was at one time the headquarters of the Inquisition, a circumstance which the present students doubtlessly consider as most appropriate. Practically all of the faculty are on a part time basis, most of them being practicing physicians or surgeons, although some also teach in other schools of the university or have staff appointments in a government research institution. A similar situation exists in the other schools and faculties of the university.

The organization and teaching of gross anatomy is quite different from that in medical schools of this country. Instead of a single course, there are two—descriptive anatomy, given in the first year, and topographic anatomy, given in the second year. Each course has its own professors and textbooks.

The descriptive anatomy course consists of a 1 hour lecture and 2 hours of laboratory per day, 5 days a week, for 10 months. For lectures, the class is divided into ten sections, each having about 200 students and its own instructor. Because the latter are practicing physicians, the lecture sections are held from 7 to 8 in the morning so that the instructor can get to his office afterward. In the laboratory, which has 26 tables, the students are divided into ten groups. Each such group works on a single cadaver and is in charge

of a laboratory professor who has nothing to do with the lecture part of the course. There are usually 25 or more students in each group. During the year, each group of students will dissect parts of three different cadavers. The bones, joints and muscles are studied and dissected on the first cadaver, the blood vascular system and viscera on the second, and the nervous system and special sense organs on the third. Because of the greatly overcrowded conditions, some of the students do their dissecting in the various hospitals of the city. The cadavers are preserved with 20 per cent formalin injected into the carotid arteries. The textbook used in this course is "Tratado de Anatomia Humana," 3 vols., by Professor Fernando Quiroz Gutierrez, head of the department of anatomy.

The topographic anatomy course consists of a 1 hour lecture each day, 6 days a week, for 10 months, and 2 hours a day of dissection, 6 days a week, for 6 months. Six professors give the lectures and eight others the laboratory part. None of these professors teach in the descriptive anatomy course. In connection with the laboratory work, each student must make 12 drawings and a plasticine model of 12 different regions of the body. These may be made from any available cadaver and at the end of the year a prize of 500 pesos is given for the best drawings. Each laboratory professor has about 35 students in a group. Each month, two cadavers are provided for the students and one for the prosector. The textbook used is *Testut y Jacobs-Anatomie Topographique*, 2 vols.

The final examination in these courses is a combined oral and practical. The examination is given each student by a committee of three professors, one lecture professor and two laboratory professors. All of them can examine the student. Each student is generally given a 20 to 30 minute oral examination on the lecture material and two hours in which to dissect any part or region of the body that is requested. If a student has been absent from the course more than 10 per cent of the time, the examination is twice as long and may also include a written part. Generally, from 30 to 40 per cent of the class is failed. A student who fails must repeat the year and the final examination consists of 1 hour for the oral part and 4 hours for the laboratory part during which he must dissect two regions.

In the third year, the students have surgical anatomy, 4 hours a day, twice a week for 10 months. Two or three cadavers, as well as autopsy and accident cases in the hospitals, are used as the teaching material.

The medical course at the Universidad de Mexico consists of six years of study and is open to students of both sexes, the main scholastic requirement being a Bachelor's degree from a Preparatoria. This, plus the very low fees, many students not paying any, accounts, in large measure, for the size of

the classes. According to one professor, there are about from 1,800 to 2,000 students in the first year class, from 1,000 to 1,200 in the second year, about 700 in the third year, 600 in the fourth year, 500 in the fifth year and from 350 to 400 graduate at the end of the sixth year. Before the medical degree is actually conferred, a student must spend six months in a village without a doctor and write a report on the medical, sanitary and public health problems of the community. This is generally done in the last half of the sixth year. On graduation, the student is considered to be a qualified physician, surgeon and obstetrician.

The other medical school in Mexico City is the Escuela Medico Militar, which was established in 1917. It is located in a new modern building in the outskirts of Chapultepec Heights, one of the most beautiful residential districts in the world. It is a much smaller school than the Universidad de Mexico, having about 220 students in all, but is much more difficult to enter.

Any boy in the country, who has graduated from a preparatoria, can apply for admission, but the entrance examinations are very difficult. First, the candidate must be able to pass the physical examination for the regular army; second, he must pass a psychological interview and, third, he must pass a three day written examination. On the first of these days, he is examined in biology, botany and zoology; on the second day, he has an examination in physics and chemistry, and on the third day, one in French and English, both of which he must be able to speak. Each examination is from two to three hours in length and is graded on the basis of from zero to ten. The grade in biology, physics and chemistry is multiplied by 10, that in zoology by 7, in botany by 6 and in languages by 5. The 60 to 70 students with the highest grades, depending on the enrollment of the upper classes, are then admitted. While in school, each student receives food, clothing, lodging, medical attention and one peso a day. The students in the upper third of their class are also given instruments and books.

The medical course consists of six years, the subject matter of gross anatomy being taken as descriptive anatomy in the first year. In the second year, they take applied anatomy. Descriptive anatomy consists of 102 hours per year of theory, taught by one professor and two assistants, and 272 hours of dissection, taught by one professor and five assistants. The textbook used is Testut-Jacobs "Anatomie Descriptive et Topographique." The applied anatomy course consists of 153 hours per year (theory and dissection), given by one professor and one assistant. Neuroanatomy is included with descriptive anatomy. In the first year, the students also receive 221 hours (theory: 68; laboratory: 153) of cytology, histology, genetics and embryology.

On graduation, the students are commissioned Majors in the Mexico Army.

They spend six months as medical officers in the field, then return to the Military Hospital in Mexico City for one year of internship. At the end of the year, the hospital selects 6 subresidents and the others go back to the field as medical officers. After one year as a subresident in the Military Hospital, the residents are selected, one for each of the major subdivisions of medicine. After graduation from the Military Medical School, a man must spend six years in the army but he is permitted to have a private practice.

The pre-university educational system in Mexico is also quite different from that in the United States. There are five years of primary school, which, in many respects, is more advanced than in this country, and three years of secondary school. From the secondary school, a student enters a Preparatoria for three years from which he graduates with a Bachelor's degree. In the Preparatoria the premedical and other preprofessional courses are taken.

There is a great need for doctors in Mexico, which partially accounts for the large size of the classes in many of the medical schools. However, the Universidad de Mexico is attempting to make a more careful selection of the students admitted to the medical school and thus reduce the size of the classes. There are also medical schools in the cities of Guadalajara, Monterrey, Puebla, Morelia, San Luis Potosi, Oaxaca and Merida.

ARRANGEMENT OF CURRICULUM

Dr. Wm. H. Welch, Johns Hopkins University, speaking on this subject at the 20th annual meeting of the Association of American Medical Colleges, March 21-22, 1910, had this to say about the arrangement of the medical curriculum:

"As regards the arrangement of the curriculum, the general concensus of opinion is that the so-called laboratory subjects—most inappropriately called the scientific subjects, because medicine and surgery are equally as scientific—should occupy the first two years and the clinical courses the last two years. It is a question, which may fairly be debated; it is still an open one, whether the student should not be brought into contact with patients at an earlier period than this, whether there should not be some sort of clinical training before this period. I think that the student, in the second year should come in contact with patients. . . . You must send them out to practice medicine. That is the fundamental idea."

How to Improve Teaching in Medical Colleges*

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Is not teaching the most important function of the medical college? Nevertheless, we do not develop the teaching potential to its fullest extent. Everyone realizes the importance of clinical material, curriculum, administration, research, physical facilities and other integral parts of the medical school. But, after all, what good are these, if teaching is so technically bad that it fails and the student does not learn?

In fact, in some colleges, research has been so heavily emphasized that teaching is retreating apologetically into the background, rather than taking its place as an equal partner. Applicants for positions to the medical faculty speak loudly about their published papers, but softly, if at all, about their teaching prowess. Furthermore, they are often chosen and promoted because of research work which has been widely recognized. This is a form of publicity which medical colleges have come to cherish.

It has become customary to judge a department of a medical college by its research and its publications. Sad to relate, a medical student does not always benefit from these papers. The student is there to learn and be taught. If the teacher is a good research man, so much the better. We must not forget, however, that the primary function of a teacher in a medical school is to teach.

I do not believe that research should be deemphasized in the medical school. With the proper attitudes, it can be used to aid measurably in the teaching of the medical student. It is not a case of either research or teaching, but rather a fusion of both with teaching taking its rightful place. Research then furthers and stimulates good teaching.

If we are convinced of the importance of the teacher, we must then proceed to develop his maximal teaching abilities. It is fundamental that he must have a complete knowledge of the subject matter. But this is not enough, teaching is an art and a science. Individual teachers vary in the types of technique they employ, but there are certain basic principles of teaching and learning which all good teachers use consciously or unconsciously.

Some are born teachers and naturally do a wonderful job without knowing anything about educational principles. For these, emphasis on the application of the principles of education will only add the frosting on the cake. For the rest of us, a study of these principles will be most rewarding. We should remember that these principles of teaching and learning have been

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arrived at, after years of voluminous and painstaking scientific research. As good scientists and medical men, we should use and modify them on the basis of our experience.

It is interesting to note what has been done in an allied field. We assume that nursing schools are on a lower educational level than medical schools. Yet, in all good schools of nursing, it is required that an instructor prepare herself for teaching by taking such courses as the following: Educational Psychology; Principles of Teaching; Physiology of Education; Planning Courses and Units of Instruction; the Modern School of Nursing and Its Educational Program; Evaluation and Reconstruction of Nursing Procedures; Student Observation and Teaching in Nursing Subjects; Nursing Supervision in Clinical Subjects; Tests and Measurements in Nursing Education; Curriculum Construction in Nursing Education.

This partial list of courses is an excellent illustration of the importance that nursing schools place on the principles of education and their application. Apparently, medical colleges do not attach a similar importance at present. Yet it seems clear that study of the principles of education and their application to teaching and learning have the same relationship as basic sciences and their application to clinical medicine. We have advanced rapidly in all phases of medicine but slowly in medical teaching. It is time to improve our medical teaching by applying scientifically proved educational principles based on careful research.

In the short space available here, we can mention only a few examples of these teaching and learning principles. Do we as teachers consciously or unconsciously apply these principles and how can we apply them best?

Motive supplies the energy necessary to acts of behavior. Motivation, then, is the foundation of all learning. There must be a purpose for which the medical student learns. Purposeful and meaningful learning occurs when the determining motives and values of the learner's living are involved. In a previous report, I showed how a medical student, who has decided to specialize in a particular field, learns best that which he believes is requisite to that specialty. There is even unconscious rejection of other subject matter. Of course, artificial motivation can be supplied. A student may fear failing in an examination, or he may wish to learn to please an instructor. The rewards of good grades or prizes furnish additional motives for learning. All of these, however, are only minor factors, when compared to the learning for use.

Basically then, successful teaching is the organization or guidance of purposeful or meaningful learning. Purposeful learning is essentially that which the student wants to learn. A teacher can organize the student's learning better than he can himself. To organize learning purposefully, the teacher needs wisdom, maturity, judgment, sympathy, knowledge and skill, and should have

the ability to stimulate the student. One can stimulate, not only through the use of knowledge, but through personality. If possible, the teacher should develop showmanship, enthusiasm and a flair for dramatization.

There are two general organizations for teaching: the traditional and the modern. The traditional is the assign or lecture-recite-test formula. The modern is the unit, whether it be the subject matter unit or the experience unit. Subject matter units and experience units may overlap. Strictly speaking, a subject matter unit is an arrangement around a central core in the subject matter for the purpose of acquiring learning arrived at from experiences related to subject matter. An experience unit is a series of educative experiences organized around the student's purpose and resulting in the achievement of the purpose by the acquisition of learning outcomes inherent in the actual experience.

Medical students are theoretically sufficiently mature to learn well from both the traditional and modern organizations of learning. We must remember, however, that physical maturity, which nature forces on us, is not necessarily accompanied by mental maturity. With proper application, the lecture or assign-study-recite or test unit and the subject matter unit can result in proper learning. Of course, in medical teaching, the availability of the actual patient and problem makes an experience unit the ideal type of organization. The other types of organization are used for economy in time and personnel.

In planning an effective organization of purposeful learning, whether it be the traditional or the modern, certain determining principles must be considered. These may be divided for simplicity into those related to the pattern of learning and those related to the human element in learning. Then, the fusion and unity of these two aspects must be demonstrated.

Some of the principles which are related to the pattern of learning are context, focalization, sequence and evaluation. Context is the problematic situation that embodies the task of learning and engages the learner's active interest and participant purpose. In medical teaching we are fortunate in that the patient can furnish a challenging, compelling, concrete, ever fascinating setting or context.

Focalization is intimately connected with its contextual setting and arises out of it. The focus highlights the nub, keypoint, the central relationship and produces clarity. It organizes the learning as a quest for insight. A good focus asks a question which the student wants to answer, and he is challenged to do some genuine thinking.

The principle of sequence in planning the organization of purposeful learning considers the development of a student's mental growth. It is obvious that sequence has a great bearing on the curriculum. However, its bearing on the specific jobs of learning within the curriculum or the course is equally important.

We ought to be aware of the structure and aims of the entire curriculum and its relation to our daily work. The sequential organization of the curriculum and the course have a marked effect on how a specific job of learning is handled. This is never a self contained unit to be covered and passed by, but rather an integral part of the development line which runs through the course and curriculum and which contributes to the student's mental growth.

Evaluation is not something that occurs at the end of learning. It permeates all learning since it is part of the process. The effectiveness and success of the job of learning is heightened by a true and discriminating appraisal of all its aspects. The student should evaluate himself too. He should know the results he is attaining while the learning job is proceeding. Oral, written tests and quizzes are not the entire story. We should not be interested in ascertaining whether a student can repeat what he has read or been told. We do want to know, however, whether he can think independently, whether he is self reliant and uses initiative, and can solve problems. The problems he will meet in medicine are not stereotyped and the student must be able to meet any and all of them.

The principles that are related to the human aspects of learning are socialization and individualization. It has been found that the student learns better in a pleasant social atmosphere with friendly personal relationships. Where there is joint responsibility, mutual helpfulness and team spirit, he takes pleasure in the achievement and success of others. This not only helps to develop a good doctor but also an excellent citizen of the community.

In individualization, the student's past experience must be taken into account. His difficulties should be diagnosed and remedied. His strong points should be used to aid his learning. If a difficulty cannot be remedied, it can be minimized. We must know his needs, his desires and his conflicts, and then make use of all of them in planning our organization of learning.

It should be clear that the principles that have been mentioned are completely interrelated and interdependent. So that in the organization of purposeful learning—an effective teaching job—there is a genuinely problematic focus in a concrete setting (context) which is supported by a cooperative group morale enriched by individual contributions. One watches and is conscious of mistakes and successes (evaluation). The process of growth and development of the course, curriculum and individual is continuous. This is teaching and learning at its best.

How can we achieve this in medical teaching? How can we improve medical teaching? We should start in the premedical school to indicate the importance of educational principles. In the medical college the principles of education should be stressed, either in separate courses or as parts of all courses of the curriculum. It is often forgotten that even if the doctor does not intend to teach in medical school, he usually does teach interns, residents and nurses.

Perhaps even more important, he certainly has to teach and educate patients. This is a job that is often neglected or poorly done.

Finally, any one who intends to teach in a medical college should take graduate work in education. We can begin immediately if each medical college would arrange at its own institution to give the basic courses in the principles of education to their entire faculty, using whatever facilities are available in the community. For the future, medical colleges should plan a graduate course leading to a master's degree in medical education.

SUMMARY

1. Effective medical teaching has not been developed to its fullest extent.
2. The principles of education have the same relationship to medical teaching as basic sciences have to clinical medicine.
3. The proper application of the principles of education will improve medical teaching.
4. Medical colleges should make the basic principles of education an integral part of the curriculum. A graduate course leading to a master's degree in medical education should be available to prospective teachers.

TEACHING OF THERAPEUTICS

"The teaching of clinical medicine includes, of course, that of therapy, and it, in my opinion, should be taught in a similar way, that is to say, first by a thorough education in the principles and technical methods of therapy, general and special; and, second, by first hand experience in the application of these methods to the actual treatment of patients during the clinical clerkship. Unfortunately, the medical wards of our hospitals are all too often mere diagnostic institutes, unprepared for the teaching and application of therapeutics. It seems to me very desirable that every university medical clinic should have associated with it, not only an institution for clinical diagnosis but also an institute for therapy, in which the methods of modern therapy may be taught and applied systematically." (Lewellys F. Barker: Proc. 26th Annual Meeting A.A.M.C., Feb. 8, 1916.)

The Training of Doctors in Britain

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How to improve the training of entrants to the medical profession is a problem of special interest in view of the recent introduction of the National Health Service in Britain. The recently published report* by a Special Committee of the British Medical Association is intended to be a constructive contribution to its solution. The committee, under the chairmanship of Professor Henry Cohen, professor of medicine at the University of Liverpool, was representative of most branches of medicine; it included a representative of the British Medical Students' Association. The committee also received evidence and opinions from many other persons interested in the subject.

The report covers the whole field of undergraduate medical training from preuniversity education to preregistration internships. Its recommendations are essentially constructive but it has some criticism to make of present methods, which it believes to be based on false conceptions of medicine and medical training. The committee goes back to first principles and seeks to answer fundamental questions. What is the basis of undergraduate medical education? What kind of education should precede entry to the medical school? What general principles should underlie the organization of the curriculum? What qualities are required of teachers of medical students? How and when should the student's progress be examined? What is the purpose of an internship? Thus, while the report is primarily concerned with medical education in Britain, its discussions of principle are applicable to the teaching of medicine in any country, and interest has been expressed already by teachers in overseas medical schools.

AIM OF MEDICAL EDUCATION

A brief reference to a few of the basic principles emphasized by the committee will illustrate the general trend of the report. The aim of medical education, says the committee:

"is to equip the student with sound basic principles, including the scientific outlook and method, a knowledge of the art of medicine and the fundamentals of the medical sciences, competence in, and understanding of, certain indispensable techniques, and an intellectual resourcefulness and initiative in the handling of unusual and unexpected situations."

The undergraduate curriculum should lay the foundation for any form of medical practice that the practitioner might wish to undertake after registration. The particular form of practice to be adopted, including general practice, needs special postgraduate preparation.

*Entitled "The Training of a Doctor," Butterworths, London, W. C. 1., England.

With such a purpose in view the committee believes that the aim of the premedical course should be

"to inculcate scientific method and to provide the basic principles and data on which the study of medicine should properly be founded."

Physics, chemistry and biology should be taught in a coordinated syllabus of basic science without any special vocational emphasis. The preclinical period should be devoted to the study of the anatomy, physiology, biochemistry and psychology of the normal man without undue emphasis of the pathological aspect.

The committee recommends that there should be a short period, the purpose of which is to "lead the student, by a smooth and unbroken transition, from his study of the normal man to the study of deviations from the normal, by way of either excess or defect, and to the general principles underlying the practice of medicine."

Throughout the section of the report dealing with clinical teaching, the stress is on the unity of medicine, the individuality of the patient and the integration of the teaching. The "compartmental" method of teaching, in which each aspect of medicine is taught as a separate subject, is condemned. In the committee's view, the purpose of the clinical curriculum is to "teach the student the general principles of medicine, to train him to a sufficient degree of skill to diagnose and treat common ailments in minor medicine and surgery, to recognize conditions for which he should summon more expert help, and so to orientate his attitude to medicine that he sees his patient as a whole."

One of the most serious defects of present day medical training in the clinical period is the failure (1) to regard the patient as a whole and (2) to teach the principles and practice of general medicine.

COMPLETE COOPERATION

The clinical curriculum must, in the committee's opinion, be conceived as a single whole and it should be planned and organized by a committee of the medical school composed of all the professors or senior members of the teaching staff. There should be complete liaison and cooperation among all the teachers, each of whom should know what his colleagues are teaching and how his own section fits in with the general plan. Each aspect of medicine should receive its appropriate emphasis in the coordinated scheme, thus avoiding the present day rivalry of specialties in the undergraduate curriculum and the constant and haphazard addition of new specialties to an already overloaded course. The committee has some interesting remarks to make on general methods of clinical teaching, on the teaching of each special aspect of medicine and on the arrangement of the curriculum.

The committee criticizes the methods usually adopted in the professional examinations on the ground that they are too frequent and that they do not efficiently test the candidate's grasp of general principles in his understanding of his subject. It recommends that the final examination should be based on the same conceptions of medicine as the curriculum itself, that is, on the integra-

tion of medicine. In place of the separate examinations in each specialty set by separate examiners, the committee would like the final examination planned as a whole by the several examiners working as a committee. Both paper questions and clinical examinations should be designed:

"to test, not only the candidate's knowledge of facts, but his grasp of general principles, his appreciation of the aims of medicine, his approach to the patient, his capacity to correlate his findings, and his ability to apply diagnostic methods to the recognition of common disease states."

In Britain, an internship, hitherto, has not formed a regular part of the medical student's training, but it is likely that legislation amending the Medical Acts will be introduced which will require every medical student to spend one year in an approved hospital practicing under supervision after he has passed his final professional examination and before he is admitted to the Medical Register. The B.M.A. Committee assumes that internships would be based on sound principle, and makes a number of recommendations relating to them. It considers that the purpose of the intern year is to consolidate the training received by the student prior to the final examination and it should be based, therefore, on the same conception as the curriculum itself. It should introduce him to the responsible care and treatment of patients who are to be studied as sick persons rather than as medical or surgical cases. The committee deprecates appointments in medical, surgical or special units, and outlines a form of internship which gives all the advantages of "rotation," but does so by studying all aspects of disease in one patient all the time instead of one aspect of disease in all patients some of the time.

RIPE FOR INVESTIGATION

It should be explained that the British Medical Association—a voluntary association of doctors—is not directly responsible for medical education in Britain. This is the function of the General Medical Council, which is a statutory body, a committee of the Privy Council. The Association is, however, concerned with the quality of the medical services given to the community by the profession and it has felt that the time was ripe for a full investigation of the methods of medical education. The present report represents the views of a Special Committee appointed for the purpose and is put forward with the object of provoking the discussion which must precede reform. Its recommendations are not mandatory and it does not desire to dictate to those in the universities and medical schools who are responsible for the organization of the medical curriculum and for the teaching of medical students. It does believe, however, that the serious consideration and implementation of some, or all, of its conclusions would result in much needed improvement.

Use of an Automatic Projector for a Collateral Film Course in Community Health*

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INTRODUCTION

The advantages of using audiovisual aids in medical school teaching is obvious theoretically. Practically, the development of such tools as an integral part of a teaching program presents many problems. First, there is the question of time. The total time allotted in the Emory University School of Medicine curriculum for preventive medicine and community health was 36 hours with the Seniors in the Class of 1948 and 22 hours with the Juniors of the Class of 1949. In determining the optimum use of this time during the school year 1947-1948, major emphasis was placed on student reports on self selected and personally investigated subjects, combined with class discussions. These courses, although named "preventive medicine," were primarily courses in community health, leaving by agreement to the departments of medicine, pediatrics and bacteriology major responsibility for much of the content usually covered by a course in preventive medicine and public health. It was considered important to spend time developing certain concepts which could have been stressed more effectively during the first two years of medical school.

THE PROJECT

The pressure for time forced a reluctant choice to use films not as a primary approach, but, secondarily, as collateral material. This may have been different if suitable films had been readily available. Two elective film courses were offered. One course was a series of 12 films for a film seminar on exotic diseases with 8 one hour weekly periods, the schedule being announced well in advance of the entire course. The films were supplemented by discussions led by local or staff physicians with clinical experience in the diseases. The pressure of simultaneous activities was probably the principal factor which caused the seminar to be a failure so far as attendance was concerned.

The other course, discussed here, was a collateral film course in community health, making use of a Sono-Vision³ automatic 16 mm. sound projector

*Presented before Conference of Professors of Preventive Medicine, Boston, November 8, 1948.

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with a translucent 21 x 29 in. screen, built into the cabinet. This projector was loaned to Emory for the purpose of this experiment by the Communicable Disease Center of the U. S. Public Health Service. The film, from 400 ft. to 1200 ft. (best about 800 ft.) was spliced end to end for continuous running, stopping automatically at the end, but easily started or stopped by simply pushing a clearly labeled button on the front of the cabinet.

No film was used without previous review. Although it was clearly desirable to make a thorough review of all available films and to select the best, time permitted only a limited number. About 2 films were reviewed for each film used. It was considered important to move ahead even with an admittedly inadequate selection of films. Twenty-five films were used over a period of ten weeks, one or two at a time, changed once or twice a week. The subjects corresponded, in some instances, with the reports being made by students in one of the classes that same week. The availability of films was an important factor in making this experiment possible. Local sources of films included both the Production and Training Divisions of the Communicable Disease Center, the Georgia State Department of Health, and the Film Library of the Surgeon of the Third Army.

The subject matter of the 25 films shown included: Eleven diseases (one film each on tuberculosis, syphilis, diphtheria, malaria, plague, epidemic typhus, tsutsugamuchi fever, encephalitis, schistosomiasis, sandfly fever and yaws); six films on environmental sanitation (2 on milk, and 1 each on water, garbage, meat and rats); three films on activities of health organization; two on world community problems; two on immunizations; and one on rehabilitation. No effort was made to limit the films to those prepared for professional groups. A summary reveals that 10 were aimed primarily at the technical or professional level, 10 were obviously for lay groups, and 5 were probably suitable for both. It was thought, for example, that medical students would profit from seeing the series of Disney films as examples of available health education materials.

The titles of the films shown were:

1. Small milk plant operation.
2. Water—friend or enemy.
3. Tuberculosis.
4. Sanitary land fills.
5. Three counties against syphilis.
6. Winged scourge.
7. Defense against invasion.
8. One world or none.
9. Boundary lines.
10. Defending your city's health.
11. Defeat diphtheria.
12. What is disease?
13. Body defenses against disease.
14. Plague control.
15. Mr. Williams wakes up.
16. Typhus in Naples.
17. Meats with approval.
18. Milk parade.
19. Keep 'em out.
20. Anthropod-borne virus encephalitides.
21. Tsutsugamuchi-prevention.
22. Rehabilitation of chronic neurological cases.
23. Schistosomiasis.
24. Sandfly fever.
25. Yaws.

3. Sono-vision Model No. 3-C-23g, manufactured for U. S. Navy by Mills Industries, Chicago. Other types of automatic projectors may be available.

The only specific announcements were on posters on the bulletin board and on the front of the projector. In addition to the title of the films, these small posters usually had a few words about the films and two or three questions aimed at stimulating interest and suggesting attitudes toward the film.

This type project requires a responsible person available on call to see that the machine operates properly, but the total time consumed is not great. Changing the films and adjusting the machine for the experiment was the responsibility of the medical school maintenance department. It required an average of only two to three hours a week of one person's time to change the films and to keep the machine functioning on a 24 hour a day basis. The greatest time consuming job is the selection of films and arranging for their procurement and return. This is primarily the task of the teacher with some secretarial help. The rental fees for some films is another item of expense.

STUDENT RESPONSE

In order to determine student reaction to the project, a simple, anonymous questionnaire was submitted to the two classes. The twenty-five films that had been shown were listed and films that were remembered were checked. In addition to six specific questions students were asked to express their "personal evaluation of the project" and to give "criticisms and suggestions for improvement." The six questions asked were:

1. "Did you make an effort to see the films regularly?" Fifty students made an effort to see all the films, 10 tried to see them occasionally, and 21 made no particular effort to see them.
2. "Did you feel your time was well spent?" Sixty-eight felt their time was well spent, one did not, and 11 answered "doubtful" or "occasionally."
3. "Did you learn as much as in same time spent in lecture?" Eleven said they learned more, 50 as much or more, 5 occasionally more, and 11 not as much.
4. "Which films (give numbers) did you think more valuable?"
5. "Which films were not worth taking time to see?" Estimates of the most valuable and the worthless films showed a startling overlapping. Nineteen of the 25 films were listed by one or more in answer to both questions 4 and 5. All but one film received a vote for "most valuable." Five listed as "most valuable" did not receive negative comment; "Winged Scourge," "Plague Control," "Typhus in Naples," "Anthropod borne Virus Encephalitides," and "Schistosomiasis." Highest vote for "most valuable" went to "Rehabilitation of Chronic Neurological Cases."
6. "Would you recommend a continuation of this project?" Seventy-eight thought the project should be continued, 1 was indifferent, and 2 saw no value in continuing.

DISCUSSION AND IMPLICATIONS

The success of the Collateral Film Course as contrasted with the Film Seminar was striking. The difficulty of working electives into a crowded schedule not arranged specifically for them is, probably, common to many

medical schools. The automatic projector is one method for offering elective courses in spite of the overburdened curriculum. The single most significant factor in the use of the automatic projector is that it is an inexpensive method for making available to the student at his individual convenience, materials which will aid in his education. He can see a film as easily as he can look at a book in the library. Many medical schools may be in the position we were at Emory. All but one hour daily of didactic work had been eliminated from the Senior schedule to permit practically full time clinical work. Competition for entire class time was extreme. This is one method by which similar materials may be presented to every one in the class without requiring scheduled meetings of the entire group. Assigned materials could be presented just as easily as electives.

The location of the projector might vary with the school, with the material, and with the purpose of the project. In cases where stress was laid on making the students responsible for mastering the material, the projector might well be in a separate room, logically an adjunct to the library. Where the approach was in the direction of "leisure time learning," location in a lounge or cafeteria might be more appropriate, with dispensing machines for food and drinks in the same room. On several occasions this projector was in the hall and practically stopped traffic. Even in the lecture room, it attracted as many, or more, other people (nurses, house staff, all types of hospital employees) as the medical student groups for which it was primarily intended.

Scheduled group assembly is even more difficult with the house staff and nurses than with medical students. There is opportunity for many experiments in hospital teaching programs with these groups.

Many students commented on the desirability of presenting other subjects in the same way, and numerous faculty members began to think more about the possibilities of what could be done with film. The automatic projector permits a start in the use of films in teaching without surrendering previous time from the scheduled class periods. The many factors determining the use of this time are much more real to the teacher responsible for the course than to the non-teaching enthusiast for visual aids. The automatic projector approach can be a "foot in the door" for a more intensive use of visual aids in a single subject, or for a more widespread use in subjects taught by various departments.

An increase in faculty group interest in something as tangible as motion pictures may afford a common focal point of interest that will permit an effective sharing of educational philosophy and teaching techniques among faculty members. Such a sharing of ideas may stimulate more experimenting in teaching methods. Experiments with the automatic projector might be with various courses in a single school, or with similar courses in a number of different schools.

The same set of films, selected by the joint efforts of professors in the same field, such as this group, could be used in a number of schools. Some central agency might finance the installation of demonstration projectors in

several dozen schools that are willing to maintain them and furnish suitable space. Use of automatic projectors will inevitably stimulate increased use of visual aids in a variety of ways.

The way films were used in this project calls for films that are self contained as teaching units. Many of us have been extremely careful to emphasize again and again that "teaching aids" must be used as a related part of a total integrated teaching program. We reemphasize this now, but also emphasize that all medical films are not simply teaching aids. Students would have profited more from these films with pertinent written materials, discussions and oral quizzes. The same is true for every book they read. One factor in the success of this project may arise from the fact that most of the films were produced as more or less self contained units. Many apologists for films in teaching may be leaning over backward to avoid the charge that we believe films can substitute for teachers. We must clarify this point and state boldly that in many instances this is true for films just as it is for books. Good teachers have not been put out of work by good books. Many good teachers spend time doing things that students, as responsible adults, might better do for themselves.

A large number of students stressed in their comments the advantages of relaxation and enjoyment while learning. All learning does not have to be hard work. The concept is far too common that respectable learning must be accompanied by rigid mental discipline. We need more definitive demonstrations of the relation of relaxation to increased effectiveness and speed in learning. The anxiety and fatigue that so often accompanies "mental discipline" may be an effective block to the efficiency of learning detailed facts. Even more important, it may prevent progress in the more difficult tasks of discovering significance and establishing valid relationships. Helping students in these two tasks might well challenge all the energies that teachers conserve by utilizing modern mechanized teaching tools. Time saved might well be devoted to helping students in the process of translating information into knowledge and knowledge into wisdom. These highest of educational functions require a dynamic, bipolar mental and emotional relationship between student and teacher as individual persons. Whence the time for these relationships except through application of labor saving devices in the management of information just as in all other areas of modern living?

Such tools as the automatic projector can be used equally well for intensive efforts in learning required materials as for more casual methods of absorbing material when relaxed. Medical faculties have had far more experience in numerous methods for the intensive approach. There is a wide open field for exploring the possibilities of learning during leisure time. Perhaps, as one student suggested, the leisure time approach is more suitable for materials of a general nature, reserving for other methods the learning of more specific facts. Both call for continuing experiments, and for the development of more adequate methods for measuring what is actually accomplished by various methods.

The two films on world community problems, "One World or None" and "Boundary Lines," were included with some hesitancy. Student response, however, was enthusiastic. This suggests a possible program of collateral materials aimed at helping the student maintain broad perspectives as he staggers along under his burden of detailed technical information. Such a course, aimed primarily at developing responsible medical citizenship and mature social consciousness, may well be a responsibility within the scope of public health or community health courses.

More than any other single group, the teachers of preventive medicine and public health feel the pressure to increase the effectiveness of their teaching methods. For some years to come these evangelists of a positive approach to health will be limited in time in a curriculum where the primary task will continue to be training physicians to take care of sick people. It is natural, then, to expect that this group will develop more and more effective experimental approaches to the problems of teaching and learning. If such experiments are sufficiently numerous, we will discover better ways, in spite of the many limitations, for developing in students broader concepts of positive health for all the people.

SUMMARY

Pressure for time in the curriculum led to an experiment in making sound motion pictures available to students in their leisure time, through the use of an automatic projector which was borrowed from the U. S. Public Health Service for the purpose of this experiment. No critical evaluation of the experiment was made, but summaries are presented of the opinions of junior and senior medical students, who almost unanimously endorsed the project enthusiastically. Twenty-five films were used over a period of three months. The implications of this experiment which are discussed include:

1. Possible methods for introducing more widespread utilization of visual aids materials into the medical curriculum.
2. Possibilities for increasing the efficiency of teaching by the use of more "leisure time learning."
3. Possible methods for developing among medical students broader concepts of a positive approach to health for the total population, in spite of the limitations of time in the present crowded curriculum.

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Reform in Medical Education

In a paper with the above title, published in the September, 1949, issue of the British Medical Journal, Dr. W. Melville Arnott, William Withering Professor of Medicine in the University of Birmingham, England, makes many timely statements dealing with various phases of medical education, especially the curriculum and teaching. The following excerpts from this paper are worthy of special emphasis. It is suggested that the original paper be read in its entirety.

SELECTION OF TEACHERS:

Let us try to analyse the qualities which should characterize the medical teacher and, in particular, the clinical teacher. The most fundamental attribute must be a thorough training in the method of science. It is this, and this alone, which will mean that his efforts will be characterized by thorough observation, critical evaluation, and intolerance of the specious and meretricious. He should be, or have been, engaged in the active prosecution of research, because the procedure of science cannot be learnt from the grand-stand. It must not be expected, however, that he should always, or, indeed, often, have been responsible for outstanding advances in knowledge—such achievement comes only to the few. Another quality of equal importance is the possession in outstanding degree of clinical ability with all its implications of experience of humanity in health and sickness, coupled with qualities of compassion and insight without which the successful care of patients is impossible.

Lastly, there is an aggregate of attributes essential in any person whose duties entail human contact and leadership—i.e., the capacity to inspire others, to get the best out of them, and to create an atmosphere of happy endeavour. Although it is hard to put into words, we all know what is meant when it is said of someone that he is "difficult." There are many ways in which this unhappy effect originates, but a common basis of it is intellectual arrogance; contrariwise, one of the most endearing of human traits is humility. However it may come about, it is an unhappy fact that some people possessed of intellectual ability are denied academic advancement solely because of their inability to create happy relations. On the other hand, outstanding qualities of rapport may more than compensate for shortcomings in other directions, in that they create an environment which enables others to attain a pinnacle of achievement which would otherwise be denied to them.

INTEGRATION OF THE CURRICULUM:

Although my qualifications allow me to speak with any measure of authority only in the department of medicine, I venture to offer some comments on education in the earlier years. Following a good grounding, preferably at the university standard, in physics, chemistry, and biology, the student passes to the study of anatomy and physiology. In this direction the most notable advance of recent years has been made at Birmingham, where under the leadership of Professors Zuckerman, Gilding and Smout there has been effected a fusion of the normally isolated disciplines of anatomy

and physiology. Zuckerman (1947) has pointed out that this separation is a temporary phenomenon which has prevailed for only some 60 years.

In 1845, William Bowman, in conjunction with Robert Todd, produced a great textbook, entitled "The Physiological Anatomy and Physiology of Man," which made no distinction in its presentation between structure and function. Apparently, the separation was in large measure due to the influence of Sharpey, followed by Schaefer, who, while contributing much to knowledge of structure, particularly in the histological field, so developed the experimental approach as to establish this tradition as an entity separate from those who concerned themselves more or less exclusively with the direct observation of tissue structure. The same influence led to the curious anomaly that, while macroscopic structure became the domain of the anatomist, microscopical anatomy remained, in general, within the province of the physiologist. The last two decades have seen anatomists adopting more and more the experimental method so as to restore the former unity of approach. Parallel with this, another, and philosophically not dissimilar, trend can be discerned in that the physiologist or anatomist—it matters little what you call him—is probing ever deeper into the dynamics of molecular behavior, making use of the modes of thought and techniques which traditionally have belonged to the chemist and physicist. These developments emphasize that the scientific study of phenomena, particularly biological, knows no narrow traditional boundaries. The approach to a problem may at one time be mainly structural, at another functional. Function may imply the methods of organic chemistry, the techniques of nuclear physics, or the refinements of electrical engineering. The researcher must be a jack-of-all-trades and a master of many, or, at least, capable of working in fruitful harmony with many masters.

WIDENING HORIZONS:

This appreciation of the unity of knowledge extends beyond the transition from preclinical to clinical, and we intend to make it a guiding principle in the reorganization of the curriculum of the clinical years. It is our intention that pathology be the central discipline around which is built the study of medicine and surgery, and at appropriate stages pharmacology and all the other subjects which constitute the traditional more or less independent content of the conventional curriculum. An essential corollary to pathology occupying the central place in co-ordinated teaching is that it should be one of the subjects of the Final Examination and should be taken within a few months of the examinations in medicine and surgery. It is quite illogical that it should be otherwise, and in this school steps are being taken to effect such an association. It may even be desirable to go further and have written papers and viva-voce examinations conducted jointly by pathologist, pharmacologist, physician and surgeon. This would serve, more than anything else, to emphasize to the student the essential unity of these subjects.

LIGHTENING THE BURDEN:

Clinical teaching to be of real value must be conducted with a small group; it is earnestly to be hoped that the increased number of students will not result in large ward classes. With a small group it is possible to make of each member an active participant in the work of the class. The student is much more likely to carry away a vivid impression of a case which has been demonstrated by a fellow student under the guidance of the teacher than if all the interrogation and demonstration has been done by the physician. We all know the form of teaching in which the lecturer talks the whole time, relates the patient's history—or what he thinks ought to be the history—rapidly demonstrates selected physical signs, answers his own questions to his own

complete satisfaction, and relegates the students to the role of passive spectators.

Probably as the result of the morbid anatomical era in medical development with its preoccupation with structure rather than function, there has tended to be undue emphasis placed on physical signs and insufficient attention paid to disordered functions as revealed by the history of the illness. Plat (1947) studied the value of the patient's history apart from physical examination as a guide to diagnosis, and came to the conclusion that in 68% of cases an accurate diagnosis—as confirmed subsequently—was made on the basis of the history, while in only 6% was it found either impossible to reach a diagnosis by this means or such diagnosis was completely wrong. This is most important, and cannot be over-emphasized in clinical training. How often one sees clinicians embarking on this or that laboratory investigation or listening intently at a stethoscope or peering into a fundus when all these investigations would have some meaning and coherence if a little time were spent on the history. Much of the trouble lies in the character of the clinical part of final and higher examinations, which places an undue premium on the "physical sign" and makes little if any attempt to assess the candidate's interrogatory ability.

A WELCOME DEVELOPMENT

A very welcome recent development in clinical teaching has been the enlargement of the scope of social medicine. Previously this subject, or public health as it was called, was more or less limited to state medicine and sanitary science, and was exclusively non-clinical. Although in every group there were notable exceptions, it was, on the whole, true that conventional clinical medicine concerned itself exclusively with the organic aspects of disease and gave but scant attention to the patient as an individual, the influence of his social environment on

the origin, development and prognosis of his illness, and the effect of this illness on the prosperity and health of the other members of the family. Up till the last few years there was an excellent reason for this omission in that the contemplation of the social and economic causes and consequences of illness brought inevitable frustration, because the aid and resources necessary to mitigate these influences were either totally absent or were provided by some charity usually gravely hampered by lack of funds. There has grown up under the new social Acts a wide range of assistance which can be brought to the aid of the victims of illness and accident, not as an act of charity but as an expression of the prudence of a community which has elected to insure itself against the malevolence of chance.

Although the general principles and the social biology of social medicine are a matter for a nonclinical department, their application to individual cases of illness is of the very stuff of clinical medicine and constitutes a matter for the clinician. It is in my opinion quite wrong for the physician to limit his view of the case to the details of the disease process and to leave the assessment of the social factors to another person, such as an almoner. The help of the trained social worker is of the greatest possible value, but it achieves its maximum value only in close co-operation with the physician. This emphasis is particularly valuable in teaching, because the general practitioner has rarely got the help of an almoner and he must be quick himself to perceive and alleviate the social stresses of illness.

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The paper by Dr. Arnott elicited comment from a number of readers. These letters were published in the Correspondence Section of the British Medical Journal for September 10, 17 and 24, 1949. Following are three examples.

Medical Education:

The ultimate aim must be the production of a general medical practitioner. Specialization follows after qualification. Are we in danger of forgetting this? It would appear that we are, since more and more time is being asked for and undue importance attached to the subsidiary clinical subjects. Instead of their being separate entities they should be fused and administered under the general headings of medicine, surgery, obstetrics and gynaecology, and pathology. For example, place paediatrics under medicine, despite the recent development of professorial chairs in paediatrics. Maternity and child welfare and venereal diseases would come under obstetrics and gynaecology, and haematology would assume its rightful place in the more general subject, pathology. These few examples may irritate specialists in the subjects mentioned, but they serve to illustrate the point I wish to make, that with integration would come realization of sphere of influence. And the time has come for specialists in certain subjects to realize that in their subject the requirements for the medical student may be generalizations rather than minutiae. A director of clinical studies would go far to make fusion and administration less difficult.—G. GORDON LENNON, B. M. J., Sept. 17, 1949.

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Training College for Medical Teachers:

Sir—The reading of your interesting educational number (September 3) stimulates me to write about an idea which I have thought and talked about but never aired in print—the training of medical teachers, at present nonexistent. It appears that even elementary teachers are trained and exercised not only in the material they present but in the method of its presentation. They are taught not only what but how to teach, and are helped in the latter by trial and helpful criticism. As regards clinical

medicine, undoubtedly the most difficult subject to teach and impart, no training is available, and teaching ability is a somewhat minor consideration in appointments to a teaching hospital. Some few are wonderful teachers by innate ability, others are inferior and often inaudible, and probably all could be improved by training and criticism when they are young.

I seriously suggest the need for a school for medical teachers, chosen naturally from the registrar type. Here for two or three months the best young medical brains in the country would be thrown together. They would have courses of elocution, psychology, methods of teaching, logic, and sociology; lecture to each other, be taught how to speak, present slides, and make reasoned presentations; and be criticized by their teachers and themselves in all they did. They would be taught to teach and how to think in the scientific method as far as possible. They would be endlessly stimulated by the endless talking of shop, with variants of tennis, music, beer, or what have you. What a glorious chance for themselves and the future of medicine.

Such an institution must presumably be set up near a good medical library and near abundant clinical material. Presumably the students might be paid by the Health Service at their established grading, but some organization would have to initiate such a scheme. I feel that the Nuffield Foundation could spend its money in no better way. And who are to be the leaders, the teachers of the future teachers? Difficult to find, but essential for success. The writers in your recent educational number show that the medical profession is not lacking in persons of the right calibre.—I am, etc., R. D. LAWRENCE, B. M. J., Sept. 10, 1949.

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Reform in Medical Education:

Now it is universally admitted that one of the most important points in the teaching of clinical medicine is the

recognition of disease in its earliest manifestations. One wonders how often the registrar type sees disease in its early stages. The most successful clinical teacher is he who can help the student to hear the faint voice of the patient's tissues talking through the patient's voice, and to continue to listen to that voice ignoring the siren voice of the patient's mother and strident voice of the patient's wife.

The natural source of this ability is the type of doctor who is accustomed to seeing disease in its earliest form, and who has learned to ignore the fond but foolish mother and the clanking of the matrimonial ball-and-chain. He is, of course, the experienced general practitioner, and no medical institution would be complete without a corps of teaching practitioners who would give the benefit of their valuable experience to medical students, the majority of whom are destined to follow in the footsteps of their teachers. I am, etc., C. BASTIBLE, B. M. J. Sept. 24, 1949.

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Amendment to the Constitution Affiliate Membership

In order to perpetuate and maintain cooperation of medical schools in other countries with the medical schools of the United States, specifically, at this time, the medical schools of Canada and the Philippine Republic, it was deemed appropriate that an affiliate membership in the Association be set up. Such membership is intended to give to affiliate members all the privileges extended to regular members of the Association, except holding an elective office and voting power on matters pertaining to the finances of the Association.

To meet this contingency, the following amendment was proposed and adopted at the annual meeting of the Association held in November, 1949, in Colorado Springs, Colorado.

ARTICLE III: (MEMBERSHIP), Sec. 7.

(Affiliate Membership) — Medical colleges in other countries which otherwise conform to the provisions of Sections 1 and 2 of this Article are eligible to Affiliate Membership.

Application for such membership shall be made and acted upon as set forth in Section III above, except that colleges which heretofore have held regular membership shall be transferred to this classification effective September 1, 1948.

The provisions of Sections 4 and 6 of this Article shall also apply to such affiliate members.

Affiliate members shall pay annual dues of \$125.00; same to be payable not later than February first of the current fiscal year of the Association.

Affiliate members shall have all the privileges extended to regular members of the Association and shall also conform to the provisions of the By-laws, except that their representatives shall not hold elective office, or vote upon matters pertaining to the finances of the Association. They shall receive copies of the official minutes of the proceedings of the annual and special meetings, such other publications and notices as may be issued and not less than six copies of each issue of the official bulletin of the Association. Representatives of affiliate members may be appointed or elected to serve on Committees.

The schools which now hold an affiliate membership are the following:

In Canada: Dalhousie University Faculty of Medicine, Halifax, N. S.; McGill University Faculty of Medicine, Montreal; Queen's University Faculty of Medicine, Kingston; University of Alberta Faculty of Medicine, Edmonton; University of Manitoba Faculty of Medicine, Winnipeg; University of Toronto Faculty of Medicine, Toronto; University of Western Ontario Medical School, London.

In the Philippine Republic: University of the Philippines College of Medicine, Manila.

Signing Up Entering Students More than a Year in Advance

At the November, 1948, meeting of the Association in White Sulphur Springs, it was announced and following that meeting a memorandum was sent to all deans stating that "Each medical school will be allowed by Selective Service Headquarters to issue a specified number of Selective Service System forms #103 as evidence of 'provisional acceptance' of premedical students to each of the three next entering classes (at present: Entering Classes of 1949, 1950, 1951 as described in Local Board Memorandum #7)."

Before most medical colleges had made any arrangements for so certifying premedical students, funds were withdrawn from the Selective Service System and the college deans were sent another memorandum, requesting them to abandon the certification of premedical students but to continue the certification of medical students.

Certain of the medical schools had, however, started the certification of students for the classes of 1950 before they received the stop order. The University of Pittsburgh School of Medicine was one of these. She had placed her deadline for acceptance to the entering class of 1950 at February 15, 1949. Subsequently, Pittsburgh moved her deadline for the acceptance to the entering class of 1950 back to November 15, 1949 and, to clarify the situation in the minds of applicants, sent out a memorandum to that effect to deans of approved colleges of arts and science. This memorandum was quite widely distributed and two copies were sent to the Association. With this memorandum before it, the

Executive Council of the Association went on record November 5, 1949 as follows:

"Though there has never been a policy established on the part of the Association, it is, nevertheless, the general consensus of our opinion that medical colleges should not select students more than one year in advance of their admission since such a practice would be very apt to be against the best interests of the students."

Dean W. S. McEllroy of the University of Pittsburgh School of Medicine, in a letter to the Association dated December 7, 1949, stated:

"The memorandum, which you have seen from our school, was sent out to all colleges, to inform them of our admission policy, which was adopted after the meeting of the Association last year at White Sulphur. . . . It has never been our policy to accept applicants a year in advance."

It is felt that this note of explanation is due the University of Pittsburgh Medical School in view of the fact that she was doing only what she had been advised to do by the Association in November, 1948.

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Correction:

In the report made by Dr. Dean F. Smiley and Miss Virginia Zaleski, published in the November, 1949, issue of the Journal, in the second line from the bottom of page 342, the word "applicants" should have read "applications." In 1938, the number of "applications" received by medical schools was 36,268—not applicants.

College News

University of Texas Medical Branch

Members of the Research Club of the Medical Branch organized a Sigma Xi Club, October 28th. Sponsorship for the Club includes Dr. John Sinclair, professor of anatomy, Dr. Arild Hansen, professor of pediatrics, Dr. J. B. Cross and Dr. Edith Darrow. At the installation dinner, Dr. E. J. Lund, Director of Marine Science of the University of Texas spoke on the subject "Aging of Cells and Organisms."

The Postgraduate Division of the School of Medicine, in cooperation with the Texas State Health Department offered a tumor postgraduate course November 2 to 5, 1949. Guest speakers included Dr. B. M. Black, Chief of the Section of Surgery of the Mayo Clinic; Dr. J. T. Farrell, Jr., professor of clinical medicine, Graduate School of Medicine, University of Pennsylvania; Dr. E. B. Helwig, Armed Forces Institute of Pathology; Dr. R. L. Sanders, professor of Surgery, University of Tennessee College of Medicine and Dr. R. A. Willis, Director of the Pathology Department of the Royal Cancer Hospital, London, England.

The 12th Pediatric Postgraduate Conference under the auspices of the Medical Branch Child Health Program and the Maternal and Child Health Division of the Texas State Board of Health was held November 7 to 12, 1949. Guest speakers included Dr. S. S. Stevenson, Pittsburgh; Dr. James G. Hughes, Memphis; Dr. O. S. Wyatt, Minneapolis; Dr. D. N. Buchanan, Chicago; Dr. A. M. McBryde, Durham, N. C., and Dr. Joseph Stokes, Jr., Philadelphia.

Dr. Etienne Wolff, professor of embryology of the University of Strasbourg, was a guest worker for several weeks last fall, under the auspices of the Rockefeller Foundation. Professor

Wolff participated in research studies in the Tissue Culture Laboratory under the direction of Dr. C. M. Pomerat. Professor Wolff offered a series of seminars on the influence of endocrine factors in sex differentiation. Dr. Allan Hemingway, professor of physiology, University of Minnesota, gave a series of lectures during October on the "Use of the Mass Spectrograph in the Analysis of Lung Gases." Dr. H. Heller, professor of pharmacology, University of Bristol, was a guest speaker November 4th. Professor Heller discussed the influence of renal factors on blood pressure. Dr. Hans Selye, professor of physiology, University of Montreal, was a guest speaker November 8th. Professor Selye discussed the alarm reaction.

T. C. Ruch, Ph.D., professor of physiology and biophysics, University of Washington, School of Medicine, was a guest speaker December 12th and 13th. Doctor Ruch discussed methods of training and research in physiology and biophysics, and gave a special seminar on some of his special research studies.

John W. Field, II Ph.D., professor of physiology, Stanford University, gave a series of special lectures on recent research covering the effects of extreme heat and cold on human beings.

Dr. R. K. S. Lim, visiting professor of physiology, University of Illinois, and former Surgeon General of the National Chinese armies, spoke December 19th and 20th, on "Nervous and Chemical Control of Gastric Secretion." Dr. Lim was professor of physiology at Peking Union Medical College before taking charge of the medical activities of the Chinese national armies.

Campbell Products, Inc., has donated

\$500 for the support of cardiac research under the direction of Dr. Arthur Ruskin of the department of internal medicine. The Texas Division of the American Cancer Society has donated \$1,700 for the support of tumor conferences under the direction of Dr. Paul Brindley, professor of pathology. The Upjohn Company has made a grant of \$3,000 to support the research studies of Dr. Edgar J. Poth, professor of surgery and Director of the Surgical Research Laboratory. Ciba Pharmaceutical Products, Inc., donated \$3,000 to support the study of intestinal antisepsis under the direction of Dr. Edgar J. Poth, professor of surgery and Director of the Surgical Research Laboratory. Sharp and Dohme, Inc., donated \$2,500 to support special research studies under the direction of Dr. Edgar J. Poth. The Falconer Scholarship Fund of Manila has awarded a scholarship of \$1,200 to Miss Rebecca Pacis, nursing student at the Medical Branch.

On November 29th, the alumni of the School of Medicine organized a campaign to raise \$250,000 for a Memorial Student Union building. The Galveston Chamber of Commerce has pledged support for the project, and will seek funds also. The Sealy and Smith Foundation donated land for the building.

The Texas State Hospital Board is considering the location of training schools for spastic children. It has been proposed to extend the facilities of the Stewart Home for Convalescent Children at Galveston, to include a training center for patients with cerebral palsy.

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University of Pittsburgh School of Public Health

The Graduate School of Public Health of the University of Pittsburgh, Thomas A. Parran, M.D., Dean, will not be prepared to take classes until the fall of 1950, and the number of students per class is expected to be between 30 and 40.

Recent assignments to the faculty are: William M. Hammon, M.D., San Francisco, appointed professor and head of the department of epidemiology effective Feb. 1, 1950. He will also be responsible for the instructional and research interests of the school in the field of microbiology. At Harvard he received the degrees of M.D. (1936), M.P.H., and Dr. P.H., and then went to the University of California Medical School, San Francisco, where he was successively lecturer, assistant professor, associate professor, and professor of epidemiology at the George William Hooper Foundation.

Adolph G. Kammer, M.D., who was graduated from the University of Pennsylvania School of Medicine in 1928. Dr. Kammer practiced medicine in Belleville, Wis., for four years; he was medical examiner for the Montrose Mining Company, Montreal, Wis., medical director of the Inland Steel Company, East Chicago, and medical director of the Manhattan Project, at Oak Ridge, Tenn. Since 1947 he has been general medical director of the Carbide and Carbon Chemicals Corporation, South Charleston, W. Va.

The school will offer both the Doctor of Public Health and the Master of Public Health degrees, and is greatly interested in securing students of high caliber so that they may fill positions of importance in the public health field upon graduation. Prerequisites for entering the school will be made public in the near future.

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Yale University Medical School

Dr. C. N. Hugh Long, Dean, proposed that the medical education system be revised so that doctors will not have to wait until they are 28 or 30 years old to start their own practice. Dr. Long recommends that students from liberal arts colleges be admitted to medical school at the end of their sophomore year. The students would then complete their premedical train-

ing and start on their medical courses under a new revised program.

The new program would have a curriculum occupying a minimum of three years, and the student's courses would include the following: first, general culture courses as may be indicated in individual cases; second, regular premedical training courses in chemistry, physics, and biology; and third, a revised program in medical sciences. In addition, the student during this period would be attending courses given by the departments of psychology and psychiatry to "gain knowledge of the emotional background of man."

At the completion of this new program, the student would then enter the final two years of the medical school program as it now exists. Under such an arrangement the student would receive his M.D. degree one year sooner than he would under the present system.

Part of the plan is already in existence at Yale. All interns and assistant and associate residents are enrolled as postgraduate students in the School of Medicine. In addition, the School has developed a cooperative program of intern training with the Middlesex Hospital in Middletown, Conn., and hopes to extend the program to other hospitals in Connecticut. Other contemplated services to hospitals in the state to provide postdoctoral training include the providing of basic science courses or other work for qualified residents of these institutions, and offering special graduate courses to hospital staffs.

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The Chicago Medical School

Dr. Maurice Oppenheim, head of the Department of Dermatology and Syphilology, since 1939, died October 26th, from a coronary attack. Dr. Oppenheim was internationally recognized as a dermatologist, and was honored in many countries. He received his medical degree at the University of

Vienna, and was appointed professor in 1915, and head of the department of dermatology in 1927. He was appointed Court Councillor in 1936. For 25 years he was head of the Department of Dermatology and Syphilology at the famous Wilhelmeinen Hospital in Vienna.

A grant in the amount of \$3,920 has been awarded to Dr. Piero P. Foa, associate professor of physiology and pharmacology, by the U. S. Public Health Service for the continuation of a research project on experimental diabetes, through investigation of the utilization of vitamin B 1 in diabetes.

A grant in the amount of \$26,396 has been awarded by the U. S. Public Health Service upon recommendation of the National Cancer Institute, to Dr. I. Davidsohn for cancer research for the ensuing two academic years. The investigative work will be done at the school, and at the Mount Sinai Medical Research Foundation, and will deal with the factors influencing the susceptibility of certain strains of mice to cancer of the breast.

A grant in the amount of \$500 from the Viobin Corporation, to be known as the Andrew C. Ivy Fellowship, has been awarded to Dr. Howard Sloan, for research studies on artificial kidney.

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University of Chicago

Dr. John R. Lindsay, professor of otolaryngology, has been appointed a member of the Committee of Hearing of the National Research Council. During the period October 24 to November 18, 1949, several members of the department of medicine, Drs. Jeanne Ward, J. Thomas Grayston and William G. Beadenkopf, together with Laura Ydse, R.N. and Mary O'Neill, made a field trip throughout southern and central Illinois for the purpose of testing student populations thus obtaining rates of histoplasmin sensitivity and pulmonary calcification. Skin tests will be made with both histoplasmin and tuberculin and through the assist-

ance of Dr. Clifton Hall, Chief, Division of Tuberculosis Control, Department of Public Health, Springfield, Illinois chest microfilm will be taken on each project.

Dr. Paul Weiss, professor of zoology, received the Honorary Degree of Doctor of Medicine, University of Frankfurt, August 27, 1949—and was elected Vice President of the International Institute of Embryology on September 10, 1949. Dr. Stefania Jablonska of the staff of the University of Warsaw, Poland, was a visitor in the Dermatology Section from October 3 to 8. Dr. Jablonska has been traveling in the United States under the supervision of the United Nations World Health Organization. The University of Chicago is conducting a series of Post Graduate Lectures and Review Courses for General Practitioners. Dr. Leon O. Jacobson, associate professor of medicine and associate dean of the Division of Biological Sciences, plans to attend the Sixth International Congress of Radiology in London next July. He will give a paper on "The Therapeutic Use of Radioactive Isotopes." Dr. Jacobson will also attend the meetings of the International Society of Hematology which will be held in Cambridge, England, in August of 1950. Dr. A. C. Bachmeyer, associate dean of the Division of Biological Sciences, was designated President-Elect of the Association of American Medical Colleges.

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University of Illinois College of Medicine

Dr. John B. Youmans, Dean of the college of medicine has resigned to accept the deanship at Vanderbilt University School of Medicine, effective March 1.

Dr. Francis H. Straus has been promoted to the rank of clinical professor of surgery. Dr. W. J. Furuta, to the rank of assistant professor of anatomy, and Dr. Benjamin Pearlman to the rank of clinical assistant professor of medicine.

Grants: Studies in arteriosclerosis, or hardening of the arteries, by the department of pathology will be supported by a \$10,000 grant from the Pauline E. Ruettinger Memorial Fund. The project will be undertaken by Dr. Maurice Lev, under the direction of Dr. G. A. Bennett. Abbott Laboratories has made a \$2,500 grant for the study of dietary therapy in liver diseases to be conducted by the department of medicine. A second grant of \$500 has been made by Abbott in support of studies in anesthesia. Smith, Kline and French has awarded \$2,000 for the study of the effect of amines in experimental renal and other experimental hypertension. The investigation will be undertaken by E. A. Ohler in the department of physiology, under the direction of Dr. G. E. Wakerlin.

Dr. Robert K. I. Lim, physiologist and former surgeon general of the Chinese Nationalist Army has been appointed visiting research professor.

Dr. Hugh McCulloch has been appointed professional lecturer in pediatrics; Dr. Sigvald B. Refsum in psychiatry.

Ten research fellowships will be awarded for one calendar year in the fields of medicine, dentistry, and pharmacy by the University of Illinois Graduate College in Chicago. The fellowships carry stipends of \$1,800 per year for medical graduates, with exemption from tuition fees for all appointees. In unusual cases, a \$2,400 stipend may be awarded to those holding a Doctor's degree. Registration in the Graduate College for full time credit toward M. S. or Ph.D. degrees is required.

Fellowships provide opportunity for research training either in the basic medical sciences or in the application of these sciences to clinical investigation. They are primarily for graduates who are in the early stages of their preparation for a teaching and research career, although time credit toward specialty board requirements in basic sciences is recognized. Fellows may be reappointed in competition with new applicants.

Candidates for fellowships must have completed a minimum training in the following way or the equivalent thereof: Bachelor's and M. D. degrees.

Appointments will be announced March 1 for fellowships beginning July 1 or September 1, 1950.

Formal application blanks may be secured from the Assistant Dean, The Graduate College, University of Illinois, 808 South Wood Street, Chicago 12, Illinois.

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New York University Bellevue Medical Center

The Stuyvesant Square Hospital (formerly The New York Skin and Cancer Hospital), will become an integral part of the New York University-Bellevue Medical Center, and will be known as the Skin and Cancer Unit.

The assets and properties of the Hospital will be utilized to support research, teaching and patient care in these fields.

Dr. Marion B. Sulzberger has been appointed professor and chairman of the department of dermatology and syphilology of the Center's Post-Graduate Medical School, and he will, at the same time, direct the work done in this field throughout the Medical Center. The cancer program will be under the direction of the Department of Surgery of the Post-Graduate Medical School, headed by Dr. J. William Hin-ton.

Gifts: From Bernard M. Baruch, \$450,000; from the Horowitz Foundation, \$100,000 to advance the work of the Institute of Physical Medicine and Rehabilitation.

Dr. C. Traverse Stepita has been appointed associate dean of the N.Y.U Post-Graduate Medical School. He will also serve as counsellor to International Students.

A gift of securities with an approximate value of \$500,000 from John D. Rockefeller, Jr., the second gift of this size which he has made to the Medical Center, has been received. This has

brought the total of the funds received in the public appeal for the Medical Center to \$21,616,999.

University of Minnesota Medical School

New appointments in the Department of Bacteriology: Dr. Dennis W. Watson, associate professor; Dr. William J. Cromartie, Dr. Karl Johansson and Dr. Hendrik DeKruif, assistant professors of Bacteriology.

A continuation course in cardiovascular diseases, will be held January 5-7. Dr. Tinsley Harrison, professor of medicine at Southwestern Medical College, University of Texas, will act as visiting faculty member. He will also present the annual Clarence M. Jackson Lecture on January 6. His subject will be "The Evaluation of Cardiac Murmurs." A course in clinical neurology will be presented January 30 to February 11. Visiting faculty members will be Dr. Fred Mettler, Columbia University; Dr. Walter Klingman, University of Virginia; Dr. Harold Voris, Chicago; and Dr. Earl Walker, Johns Hopkins University. A continuation course in pediatrics will be given January 26-28. Dr. Franklin Top of the Herman Kiefer Hospital, Detroit, will be visiting faculty member.

A continuation course in cancer will be presented February 16 to 18, 1950. Dr. Henry K. Beecher, professor of anesthesiology at Harvard University Medical School, will be the visiting faculty member for the course and will also deliver the E. Starr Judd Lecture in surgery February 16.

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Indiana University School of Medicine

Further expansion of the full time staff on the Medical Center campus at Indianapolis and the University campus at Bloomington to meet an increased student enrollment and a growing research program has been announced. Recent appointments: Dr. Herbert S.

Gaskill, professor of psychiatry; Dr. Edward W. Shrigley, associate professor microbiology; Dr. Philip F. D. Seitz, assistant professor of psychiatry and director of psychiatric research. Department of Anatomy at Bloomington: Dr. Lawrence O. Morgan, professor; Dr. Raymond G. Murray, associate professor; Dr. Richard C. Webster, assistant professor.

The School of Medicine presented a televised surgical and clinical program during the recent centennial meeting of the Indiana State Medical Association.

Construction is in progress on a three story research wing, an addition to the James Whitcomb Riley Hospital for Children. The building, being erected by the State at a cost of nearly \$400,000, will be devoted to research into the diseases of children, the research program to be supervised by the School of Medicine. The James Whitcomb Riley Memorial Association which was instrumental in securing funds for erection of the hospital as a memorial to the Hoosier poet for whom it was named, is creating a million dollar fund through public subscription, to support the research program.

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Southwestern Medical School University of Texas

Correction: The identity of Southwestern was not properly conveyed in the news item which appeared in the November issue of the Journal, which said that the Southwestern Medical Foundation became the medical school of the University of Texas. The correction is that the Southwestern Medical College of the Southwestern Medical Foundation is now the Southwestern Medical School of the University of Texas. As a state institution, admittance will, in the future, be limited to bona fide residents of Texas. The 1949 entering class was increased to 100 students, and it is anticipated that this maximum will be maintained for future entering classes.

Dr. Rupert A. Willis of the Royal Cancer Hospital, London, England, addressed the students and physicians of Dallas on several occasions. His discussions included: "The Spread of Tumors", "Vestigial Structures and Their Pathology," "Gastric Neoplasia". Dr. Curtice Rosser, professor of proctology and chairman of the Department, has been elected President of the Southern Medical Association.

* * *

Western Reserve University School of Medicine

The training course for cardiovascular investigators sponsored jointly by the U.S. Public Health Service, American Heart Association, and Western Reserve University School of Medicine, will be offered in the Department of physiology for the second time, July 1, 1950-June 30, 1951. Professor C. J. Wiggers will be in personal charge. The course will consist of formalized training in research methods used in cardiovascular research, assisting experienced investigators with current research, independent research under supervision, and experience in the preparation of a manuscript.

Postdoctorate candidates accepted for training will be recommended to the Director of the National Heart Institute, U.S. Public Health Service, for a research traineeship carrying a stipend ranging from \$3,000 to \$3,600 per annum, depending on their marital status. A maximum of ten trainees can be accepted.

For information and application blanks, address Dr. C. J. Wiggers, Program Director, Western Reserve University School of Medicine, Cleveland 6, Ohio.

* * *

University of California Medical School

An intensified program of research on cardiovascular diseases, has been launched at the Medical School. Dean Smyth has appointed a Cardiovascular

Board. Chairman of the board is Dr. James Hopper, assistant professor of medicine and director of the clinical laboratories of the University Hospital.

The new program has been given impetus by the receipt of \$40,850 for the initiation or continuation of five co-operative research projects. These funds were awarded by the National Heart Institute. In addition, a teaching grant-in-aid of \$14,000 has been awarded to survey the teaching of cardio-vascular diseases in the medical school and to formulate recommendations directed toward the improvement and expansion of existing facilities and teaching aids.

Dr. Joseph C. Aub, professor of research medicine and director of medical laboratories at the Harvard University Medical School, is presently at the Medical School as a visiting professor of oncology.

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University of Kansas School of Medicine

New Appointments: Dr. Stanley R. Friesen, Assistant professor of surgery; Dr. Thomas N. Hall, assistant professor of pediatrics; Dr. Richard E. Johnson, assistant professor of pathology and oncology; Dr. F. W. McCoy, assistant professor of anatomy; Dr. Dwight J. Mulford, assistant professor of biochemistry; Dr. Leonard A. Walker, assistant professor of oncology.

The Don Carlos Guffey prize in obstetrics and gynecology, consisting of \$100, has been set up by Dr. Guffey, emeritus professor. It will be awarded annually to the graduating senior doing the best work in obstetrics and gynecology.

The Kansas University Endowment Association has been given the use of an income from 1,340 acres of land by Mr. Dixon Fagerberg of Prescott, Arizona. The land is valued at approximately \$50,000 and the funds from the gift are to be placed in The Dixon Fagerberg Fund for Medical Research at the Medical Center.

Tulane University of Louisiana School of Medicine

The third annual Rudolph Matas Lecture, will be presented January 27, under the auspices of Nu Sigma medical fraternity. The address will be given by Dr. Cecil J. Watson, professor of medicine, University of Minnesota, who will speak on "Modern Concepts of Liver Function and their Alteration in Disease."

The department of social service has been re-established to help patients of the New Orleans area with environmental and personal problems related to their illness. The department will emphasize: (1) Practice of social casework. (2) Participation of program planning in the school of medicine. (3) Taking part in development of social and health programs in New Orleans. (4) Social research. (5) Participation in educational programs for professional personnel. It will also provide a training center for Tulane school of social work students during their training period.

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St. Louis University School of Medicine

Dr. Sidney Smith has been appointed assistant professor of surgery. Dr. Smith began his post-graduate work in surgery at Northwestern University, where he taught experimental surgery. Interested in the preservation and transplantation of blood vessels, he is exploring the possibility of a blood vessel bank.

The School of Medicine has been awarded a \$4,000 grant by the National Cancer Institute for continued studies by Dr. E. A. Doisy of radioactive cortisone.

Grants totalling \$48,980, for use in research and teaching in the field of heart diseases, have been awarded to the School by the National Heart Institute. The grants will be administered by Dr. Albert Kuntz, professor of anatomy, Dr. Alrick B. Hertzman, professor of physiology, and Dr. E. Lee Schrader, associate professor of internal medicine at

Saint Louis University. The research programs will primarily concern an investigation of the involuntary nervous system and its relation to disease conditions such as diseases of the heart, cancer, high blood pressure, and disorders of the intestinal tract.

Dr. Franklin H. Albrecht, a member of the faculty for the past 33 years and chairman of the department of orthopedic surgery, has been appointed associate professor emeritus. Dr. Robert M. O'Brien, instructor in orthopedic surgery, has been appointed assistant professor in the department and chairman to succeed Dr. Albrecht.

* *

Dalhousie University Faculty of Medicine

Dalhousie invites applications for the position of professor of pathology and Head of the Department at Dalhousie and Provincial Pathologist in the Department of Public Health, Province of Nova Scotia, Canada. Applicants must be medically qualified with not less than ten years experience in pathology including histopathology, haematology and forensic medicine. Total salary from both sources \$9,000.

Dalhousie also invites applications for the position of professor of pharmacology. Applicants should preferably be medically qualified with teaching experience. Salary from \$5,000 to \$5,500 according to training and experience. The University makes provision for annuity and group insurance. Applications together with credentials should be sent to H. G. Grant, Dean, The Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia.

* *

Indiana University Medical Center

A one-day Heart Symposium and a two-day Cancer Program have been announced as a part of the postgraduate activities of the School of Medicine. The Heart Symposium will be held Feb. 15, with the program being prepared by the School and the Indiana Heart

Association. The annual two-day Cancer program, scheduled for April 19-20, is again being presented with the support of the Indiana Cancer Society. Speakers and other arrangements are to be announced in a few weeks.

The annual Graves Lectures of the School of Medicine will be presented in April by Dr. Cyril N. H. Long, dean of the Yale University School of Medicine. The lectures will be presented on the Bloomington campus under the sponsorship of the department of physiology.

Dr. Edwin A. Lawrence has been appointed as professor of surgery effective Jan. 1, with the additional title of Coordinator of Cancer Treatment and Research. Dr. Lawrence has been connected with the Utah University School of Medicine in a similar capacity for the past three years and previously was on the staff of the Yale School of Medicine.

* *

George Washington University School of Medicine

A nine-foot replica of a Greek statue of Hippocrates dating back to the fourth century B.C. has been given to the School of Medicine. The statue was presented to the University by Dr. Skevos Zervos, Greek physician authority on "the father of medicine." The original statue was found in the Dodecanese Islands, birthplace of Dr. Zervos, and now stands in Athens.

Grants amounting to \$70,480 for cancer research were awarded the University by the U. S. Public Health Service and the American Cancer Society. Medical students will take part in research under the grant.

* *

Medical College of the State of South Carolina

Dr. Kenneth M. Lynch, dean, has been given additional duties as president of the college. Dr. Lynch is professor of pathology and chairman of the South Carolina Board of Health.

University of Nebraska College of Medicine

Promotions: Dr. Herbert H. Davis, professor and chairman of the department of surgery; Dr. William R. Hamsa, professor and chairman of the department of orthopedic surgery; Dr. Herman M. Jahr, Professor and chairman of the department of pediatrics.

New Appointments: Dr. Miles E. Foster, assistant professor of pathology and bacteriology; Dr. Robert S. Lockwood, professor of military science and tactics; Dr. John M. Thomas, assistant professor of pediatrics.

Many other promotions and new appointments have also been made in various departments in the lower grades or ranks.

* * *

State University of Iowa College of Medicine

Dr. Nathaniel G. Alcock, professor and head of the department of urology, has retired. He will be succeeded by Dr. Rubin H. Flocks. Dr. Wilbur A. Robbie, research associate professor of ophthalmology, died last September. Dr. Cecil S. O'Brien has retired as head of the department of ophthalmology.

Appointments: Dr. Lucien E. Morris, assistant professor of anesthesiology; Dr. James W. Culbertson and Dr. Thomas Lyle Carr, assistant professors of internal medicine; Dr. Steven M. Horvath, associate professor of physiology; Dr. Edward C. Clark, assistant professor of neurology.

* * *

University of Pittsburgh School of Medicine

The Gibson Laboratory has been established by a grant from the Addison H. Gibson Foundation. The laboratory provides additional facilities for studies in applied physiology, carries on investigations of arteriosclerosis and provides service facilities for handling radioactive isotopes in the university. Dr. Campbell Moses Jr. is director of the laboratory.

* * *

Medical College of Virginia

Dr. Robert A. Kimbrough, professor and chairman, department of obstetrics and gynecology, Graduate School of Medicine, University of Pennsylvania, gave the first Charles R. Robins Memorial Lecture at the Medical College of Virginia, November 11. Dr. Kimbrough discussed "Carcinoma of the Endometrium." The lecture was established by Dr. Spetswood Robins and Charles R. Robins, Jr. in memory of their father who was a nationally known gynecologist and a founder and for 30 years president of Stuart Circle Hospital in Richmond.

* * *

Bowman Gray School of Medicine

Promotions: Dr. R. Winston Roberts Jr. to assistant professor of surgery in charge of ophthalmology; Dr. Marjorie A. Swanson, to assistant professor of biochemistry; and Dr. Dorothy Meyer Tuttle, to assistant professor of microbiology and immunology.

Appointments: Dr. Alfred Richardson, instructor in physiology and pharmacology; Dr. Benjamin J. Lawrence Jr., and Dr. Creed Flannery McFall Jr., associates in physiology; Dr. Thomas W. Simpson, instructor in preventive medicine.

* * *

University of Wisconsin Medical School

A postgraduate course in pediatrics will be presented January 9 to 13. Dr. John E. Goncze, Jr., chairman of the department of pediatrics, will be in charge. Registration will be limited to 30; fee, \$25.

* * *

Cornell University Medical College

Dr. Robert F. Pitts, professor of physiology at Syracuse University College of Medicine since 1946, will return to Cornell to become head of the department of physiology and biophysics and professor of physiology.

**Wayne University
College of Medicine**

Gifts and grants amounting to \$27,810 have been received. The largest grant was \$25,000 from the U.S. Public Health Service to continue the program for implementation of cancer teaching during the calendar year 1950. The G. D. Searle & Company gave \$2,800 for investigation of pharmacological aspects of quinidine-like compounds, under the direction of Dr. V. A. Drill. Mrs. Jeane H. Hagerman provided \$10.00 for research in leukemia, under the direction of Dr. Lawrence Berman.

* * *

**University of Manitoba
Faculty of Medicine**

Dr. A. I. Mathers will retire from the deanship at the end of the current session. A committee has been appointed to select his successor.

Boston University School of Music

Two additional federal grants totaling \$66,250 for cancer research have been received from the National Cancer Institute through the U. S. Public Health Service. Aid of \$49,900 will be used to build animal housing quarters for experiments in cancer research. Dr. Henry M. Lemon, co-ordinator of cancer research, will direct the use of \$16,350 for experiments on cancer from the chemical point of view.

* * *

Jefferson Medical College

Dr. Edward F. Corson has been appointed head of the department of dermatology. He succeeds Dr. Clarence S. Livingood who resigned.

* * *

Queen's University Faculty of Medicine

Dr. George S. Melvin, dean, died last fall after a long illness. His successor is Dr. C. H. Ettinger.

COOPERATIVE PLAN
FOR APPOINTMENT OF INTERNS 1950-1951*
Approved at Meeting of
ASSOCIATION OF AMERICAN MEDICAL COLLEGES
Colorado Springs, Colorado
November 7-9, 1949

1. Applicants may visit hospitals and be interviewed by the Intern Committee at any time, but the hospital or its representative shall not commit or bind the hospital or the applicant *before the 3rd Tuesday of February.*
2. Application should be made in duplicate; the original to be forwarded to the dean of the applicant's medical school for transmission together with credentials to the hospital or hospitals of the applicant's choice; the second copy to be mailed directly to the hospital or hospitals by the applicant as soon as he or she has filed the original with the dean.
3. Applications filed with the dean shall be forwarded by the dean to the hospital with credentials *on the third Tuesday in December.*
4. The application may be accompanied by letters of recommendation from faculty members which, however, will not precede the sending of credentials by the Dean.
5. Schools of Medicine shall not limit the number of applications filed by any individual.
6. The tendering of internship appointments by hospitals shall be made by telegram. No telegram shall be sent which will arrive prior to 8:00 P. M., of the 3rd Tuesday in February. (Telegrams may be filed in advance with telegraph offices for delivery at 8:00 P. M. local time.)
7. Hospitals may notify alternates of their status at the same time.
8. Acceptance of appointments should be made promptly. Applicants should be allowed a reasonable period of time to consider appointment offers.
9. Upon acceptance of an appointment, prompt notification of withdrawal of applications to other hospitals which have offered appointments must be made by the applicant. Notice of such withdrawals may be sent by collect telegram.

*Important changes from 1949 plan are printed in italics.

General News

An Innovation Prizes for Medical Students, 1950

The Council of the British Medical Association is prepared to consider the award in 1950 of prizes to medical students for essays submitted in open competition. The subject of the essays shall be "Clinical Teaching in Relation to the Practice of Medicine."

The purpose of these prizes is the promotion of systematic observation among medical students. In awarding the prizes due regard will be given to evidence of personal observation. No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. Any medical student who is a registered member of a medical school in Great Britain or Northern Ireland at the time of submission of the essay is eligible to compete for a prize.

—Brit. M. J.; Nov. 12, p. 215, 1949.

* *

National Foundation for Infantile Paralysis

The Foundation is offering postgraduate research fellowships for one to three years in the fields of virology, orthopedic surgery, pediatrics, epidemiology and neurology. These fellowships are available to properly qualified candidates whose objectives are research and teaching in these fields.

Eligibility requirements include United States citizenship; sound health; degree of Doctor of Medicine or Doctor of Philosophy; two years' residency training in the specialty; and a program of study and detailed plan of investigation.

Financial benefits are flexible and will be arranged according to individual needs. Candidates will be selected competitively by a committee of scientists and clinicians.

Additional information and applications may be obtained from Professional Education Division, The National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.

* *

Professor of Medical Bibliography

Instruction in bibliography and reference source materials has long been an important subject in the medical school curriculum. Two universities have established professorships in this field. At Tulane University of Louisiana, School of Medicine, Miss Mary Louise Marshall, Librarian of the Ru-

Markle Fund for Appraising Medical Students

At a meeting of the directors of the Markle Foundation held December 6, 1949, the Association of American Medical Colleges was granted \$45,000 for special studies by its Committee on Student Personnel Practices. These studies are:

1. A continuation of the project of Dr. Brosin and Dr. Earley of appraising by psychiatric techniques the medical students entering the University of Chicago and the University of Illinois. The Committee believes that this study may lead to fruitful suggestions on interview techniques, supply information on the extent of certain psychiatric problems among first year medical students, and increase our knowledge of the type of student being admitted to the study of medicine.

dolph Mates Medical Library and of the New Orleans Parish Medical Society Library has been appointed professor of medical bibliography. Vanderbilt University Medical School has conferred on its librarian, Mrs. Eileen R. Cunningham, the title of professor of medical library science.

* *

Primary Aim of Education

Few educators dispute the fact that the development of the thinking process in our college students should be the primary aim of education. In our attempts to get at the objectives of education we often come to regard the "curriculum" as the heart of the problem, and assume that "habits of thought" are by-products of our learning. On the other hand, in our enthusiasm to teach students to "think for themselves" we are apt to by-pass the importance of facts and forget that thinking is impossible in the absence of information. Our formula is simple—"facts and thought"—but the problem of developing the mental functions and capacities from a store of knowledge is much more complicated.

—B. von Haller Gilmer, *J. Higher Ed.*, Dec. 1949.

* *

Building a Curriculum

To build a curriculum around subject-matter is one thing; to build it around the human elements that compose a faculty is quite another.

If we review almost any course of

instruction, we shall find that it is not too difficult to measure the acquisition and retention of factual material nor the degree to which this information has been integrated. But if we take the next logical step and inquire how well the student can use the principles he has learned, measurement becomes quite a different problem.—B. von Haller Gilmer, *J. Higher Ed.*, Dec. 1949.

* *

Fulbright Scholars

Under the Fulbright Acc, 125 American students have received awards for a year of study and travel in Great Britain. They came from thirty-two states and the District of Columbia, and will study at more than a dozen British universities. Their interests lie in such fields as bacteriology, drama, economics, international law, political and social science, and zoology. They were chosen from more than 2,000 students who applied for awards to study in the United Kingdom.

* *

Laboratory Training Classes

The communicable disease section of the Public Health Services in Atlanta, reports that 25 laboratory training classes, in various subjects will be given during 1950 in Atlanta, Georgia. These classes range from one week to three weeks in duration. Information and applications should be requested from the laboratory division of communicable disease.

Book News

Early Carcinoma of the Uterine Cervix

By Hansjakob Wespi, M.D., Chief of the Obstetrical and Gynecological Department, Frauenfeld Hospital, Aarau, Switzerland. Translation by Marie Schiller, Ph.D.; Foreword and Survey by Walter Schiller, M.D., Pathologist of the Women and Children's Hospital, Chicago. Grune & Stratton, Inc., New York. 1949. Price, \$6.50.

Specialists in this field will appreciate this book. It is concise, yet gives complete coverage, easily read and understandable. The bibliography is not too extensive. The nearly 100 illustrations, virtually all photomicrographs, are excellent and highly informative.

* *

Atlas of Obstetric Technic

By Paul Titus, M.D., Obstetrician-Gynecologist to St. Margaret Memorial Hospital, Pittsburgh. Illustrations by E. M. Shackelford. Ed. 2. The C. V. Mosby Company, St. Louis. 1949. Price, \$7.50.

In addition to the rearrangement of the book, a brief new section on pregnancy and antepartum care and another on analgesia and anesthesia have been added. All of the text has been revised, especially that dealing with suture material, the parts on pelvimetry and the use of forceps. The blank pages for notes and sketches have been retained at the end of each. The 200 illustrations are not only well made but realistic and easily interpreted.

* *

May's Manual of Diseases of the Eye

Revised and edited by Charles A. Perera, M.D., Assistant Clinical Professor of Ophthalmology, College of Physicians and Surgeons, Columbia University. Ed. 20. Williams & Wilkins Company, Baltimore. 1949. Price, \$5.

For nearly 50 years this has been an accepted text in ophthalmology. The present reviser has done a good job to bring the book up to date and adding many new illustrations.

* *

Bone and Joint Radiology

By Emerik Markovits, M.D., Radiologist of the Steiner Cancer Clinic, Atlanta, Ga. The Macmillan Company, New York. 1949. Price, \$20.

This work is definitely a "must" for the radiologist and an aid to him who must resort to the interpretation of roentgenograms. It is a splendid piece of work and authoritative. The illustrations really illustrate.

* *

Textbook of Physiology

(Originally by William H. Howell). Edited by John F. Fulton, M.D., Sterling Professor of Physiology, Yale University School of Medicine with collaborators and assistants. Ed. 16. W. B. Saunders Company, Philadelphia. 1949. Price, \$10.

This text is too well known to call for comment. It has been a standard teaching text for more than 40 years. It has been revised and many parts have been rewritten. An extensive chapter on the endocrines has been added and the section on the electrocardiogram has been rewritten, also a separate chapter on muscle and a chapter on the psychology of micturition.

* *

A Short Practice of Surgery

By Hamilton Bailey, F.R.C.S., Surgeon Royal Northern Hospital, London, etc., and R. J. McNeill Love, F.R.C.S., Surgeon Royal Northern Hospital, London, etc. Ed. 8. The Williams & Wilkins Company, Baltimore. 1949. Price, \$10.

One would hardly be tempted to call a 1,000 page book "short". However, the contents are presented briefly but with full coverage and the more than 1,000 illustrations will be found very helpful by medical students. On the whole, this is a good student text.

* *

Clinical Diagnosis by Laboratory Examinations

By John A. Kolmer, M.D., Professor of Medicine, School of Medicine, Temple University. Ed. 2. Appleton-Century-Crofts, Inc., New York. 1949. Price, \$12.

Completely revised and considerably enlarged by the inclusion of much new material, thus bringing the book completely up to date. It is divided into three parts: I: The clinical interpretation of laboratory examinations. Twenty-one chapters are devoted to this section. II: The practical applications of laboratory examinations in clinical diagnosis, 11 chapters. III: Technic of laboratory examinations, 12 chapters. This section is for the laboratory technician, although physicians who make their own laboratory examinations will find the technique described fully and understandably. Unfortunately the book is large, 1,200 pages, and bulky. A most complete index of 100 pages is a notable feature as are also the illustrations and charts. Is it necessary to give so many references? Is it not to be assumed that the author has combed the literature thoroughly before writing the book? It takes up so much space and adds bulk.

Textbook of Surgery

(By American Authors). Edited by Frederick Christopher, M.D., Professor of Surgery, Northwestern University Medical School. Ed. 3. W. B. Saunders Company, Philadelphia. 1949. Price, \$13.

The list of authors can be regarded as being representative of "who's who in surgery." It is a warranty of the worth of the book as a complete text. It is offered as a "concise presentation of surgery which is characterized by the maximum authority." "Concise" could be regarded as an overstatement for a book of more than 1,500 pages and nearly 800 illustrations, but it is authoritative. Its size makes it unwieldy but the double column arrangement makes for easy reading. Of course, the coverage of the subject is complete. Every medical student will do well to provide himself with a copy of this book.

* * *

Atlas of Surgical Operations

By Elliott C. Cutler, M.D., Late Moseley Professor of Surgery, Harvard University, and Robert M. Zollinger, M.D., Professor and Chairman of the Department of Surgery, Ohio State University, College of Medicine. Ed. 2. The Macmillan Company, New York. 1949. Price, \$9.

He who would do good surgery and is in need of help will find this atlas most helpful. The intimate technical steps of surgical procedures are shown in 106 black and white line drawings, so vividly, in fact, that one gains the impression that he is watching an actual operation. Text matter, directly opposite the picturization, is concise and so arranged with bold face type that reference from plate to text and vice versa is facilitated. This book is valuable not only for the student but more especially for the occasional surgeon whose experience and activities are limited to a community away from medical centers. He is led every step of the way by fine illustrations and accurate descriptions of technical details.

* * *

Tom Cullen of Baltimore

By Judith Robinson. Oxford University Press, Toronto. 1949. Price, \$3.50.

A biography, well written, of a wonderful man.

* * *

Philosophy of Nature

By Moritz Schlick. Philosophical Library, New York. 1949. Price, \$3.

An outline of an extremely precise and significant philosophy of physics.

Stedman's Medical Dictionary

Edited by Norman Burke Taylor, M.D., University of Western Ontario in collaboration with Allen E. Taylor, M.A. Ed. 17. The Williams & Wilkins Company, Baltimore. 1949. Price, \$8.50 (with thumb index); \$8 (without).

Carefully revised; obsolete words deleted; new words added. Special features are the section on etymology, descriptions of techniques of laboratory tests, tables of weights and measures, lists of terms sanctioned by the Basle Anatomical Convention and many others. The very small type is rather distressing for those whose eyesight is not of the best but the excellence of the subject matter more than makes up for this defect. Short bibliographical sketches of the principal figures in the history of medicine are a new feature.

* * *

Vitaminology

The Chemistry and Function of the Vitamins. By Walter H. Eddy, Ph.D., Emeritus Professor of Physiological Chemistry, Teachers College, Columbia University. The Williams & Wilkins Company, Baltimore. 1949. Price, \$6.

This monograph covers the entire vitamin field. The chapters on the individual vitamins are divided into three sections: what the vitamin does; its place in the chemical field and its value in human and domestic animal nutrition.

* * *

Microbiology

By Florence C. Kelley, Ph.D., Associate Professor of Bacteriology, University of Oklahoma School of Medicine, and K. Eileen Hite, M.D., Formerly Assistant Professor of Bacteriology, University of Chicago. Introduction by G. M. Dack, M.D., Professor of Bacteriology, University of Chicago. Appleton-Century-Crofts, Inc., New York. 1949. Price, \$6.50.

This book covers general and pathogenic microbiology. The text is divided into two parts. The first part emphasizes the large phylogenetic groups of microorganisms; the second part treats of parasitism and disease, epidemiology and public health, plus an appendix devoted to technical methods.

* * *

Bentley's Textbook of Pharmaceutics

Revised by Harold Davis, Ph.D., Ph.C., with collaborators. Ed. 5. The Williams & Wilkins Company, Baltimore. 1949. Price, \$7.50.

For the pharmacy students and pharmacists.

The Clinical Examination of the Nervous System

By G. H. Monrad-Krohn, M.D., Professor of Medicine in the Royal Frederick University, Oslo, Norway. Ed. 9. Paul B. Hoeber, Inc. Medical Book Department, Harper & Brothers, New York. 1949. Price, \$5.

The author says that this book covers what the title says, "nothing more and nothing less." It is not intended as a textbook but as a guide. Nearly one-half the book is given over to a discussion of tests of various kinds and aids to diagnosis and their interpretation.

* *

Acute Appendicitis and Its Complications

By Frederick F. Boyce, M.D., Assistant Professor of Clinical Surgery, Tulane University of Louisiana School of Medicine. Oxford University Press, New York. 1949. Price, \$8.75.

This book is devoted entirely to acute appendicitis as being an inherently serious, extremely urgent, potentially deadly disease to which too little attention is paid. The theme of the book is "the urgency of acute appendicitis." Its object is to "sound the alarm." The background of the book is furnished by 6,441 cases of acute appendicitis.

Textbook of Physiology

By William D. Zoethout, Ph.D., Professor Emeritus of Physiology, Chicago College of Dental Surgery, and W. W. Tuttle, Ph.D., Professor of Physiology, College of Medicine, University of Iowa. Ed. 10. The C. V. Mosby Company, St. Louis. 1949. Price, \$4.75.

Completely revised, with improvement of subject matter with reference to the logical sequence of its various parts.

* *

Explorer of the Human Brain:

The Life of Santiago Ramon y Cajal by Dorothy E. Cannon, with a memoir of Dr. Cajal by Sir Charles Sherrington. Henry Schuman, New York. 1949. Price, \$4.

The life of Cajal was not what one would expect of a man who gained his prominence. As a boy, he was a hellion; as a young man, a daredevil, adventurous; in his maturity he became a distinguished scientist. Cajal's admirers—they are numerous—will enjoy this book. It reads more like fiction than fact.

* *

Official Preparations of Pharmacy

By Charles Oren Lee, Ph.D. Professor of Pharmacy, Purdue University School of Pharmacy. The C. V. Mosby Company, St. Louis. 1949. Price, \$5.50. For the pharmacist.

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